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US Army Corps
of Engineers

GEOPHYSICAL INVESTIGATION AT PHILADELPHIA NAVAL SHIPYARD

by

Michael K. Sharp

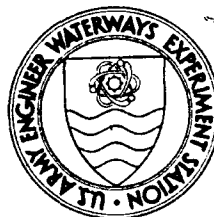
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DEPARTMENT OF THE ARMY

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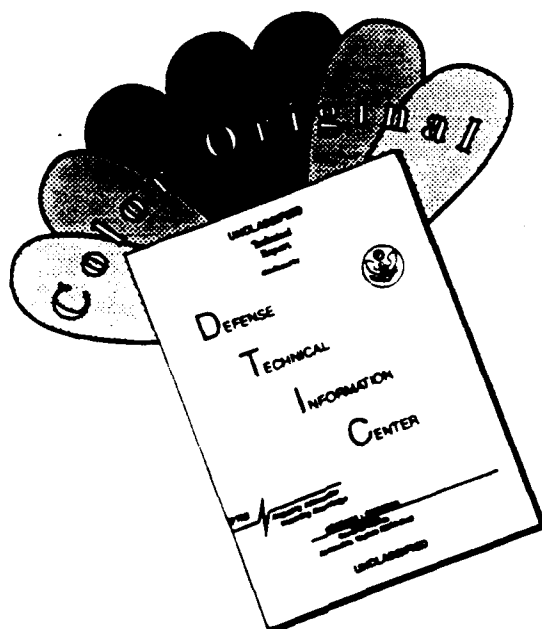
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13. ABSTRACT (Maximum 200 words) <p>Results of a geophysical investigation at the incinerator site of Philadelphia Naval Shipyard are presented. Following the end of World War II, 50 to 60 pallets of gas cylinders were reportedly buried to the west of the old incinerator at Girard Point. The contents of the cylinders are unknown. Extensive filling operations occurred at Girard Point from 1940 to 1970, resulting in shallow groundwater surface in the area, 2 to 10 ft deep, which would indicate that the cylinders are probably in direct contact with the water surface. The geophysical investigation presented in this report was designed to help alleviate uncertainties produced from previous studies in the area.</p> <p>The geophysical program included electromagnetic induction and magnetic survey methods. The results of the various surveys were integrated, and numerous anomalous areas were interpreted. Anomalies warranting further investigation were presented along with a priority ranking.</p>				
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PREFACE

A geophysical survey was conducted at the Philadelphia Naval Shipyard (PNSY), by personnel of the Geotechnical Laboratory (GL), US Army Engineer Waterways Experiment Station (WES), from 9-13 July 1990 and 9-25 July 1991. The work was performed for the Environmental, Safety, and Health office of the PNSY.

This report was prepared by Mr. Michael K. Sharp, Earthquake Engineering and Geosciences Division (EEGD). The work was performed under the direct supervision of Mr. Joseph R. Curro, Jr., Chief, Engineering Geophysics Branch. The work was performed under the general supervision of Drs. A. G. Franklin, Chief, EEGD, and William F. Marcuson III, Chief, GL.

Field work and data analyses were performed by Mr. Michael K. Sharp, EEGD. Mr. Reid Parramore, Senior Environmental Engineer, PNSY, provided invaluable support during the data collection phase of this study.

Dr. Robert W. Whalin was Director of WES. COL Leonard G. Hassell, EN, was Commander and Deputy Director.

CONTENTS

	<u>Page</u>
PREFACE	1
CONVERSION FACTOR, NON-SI TO SI (METRIC) UNITS OF MEASUREMENT	3
PART I: INTRODUCTION	4
Background	4
Scope	4
PART II: GEOPHYSICAL TEST PRINCIPLES AND FIELD PROCEDURES	6
Electromagnetic Induction Principles	6
Magnetic Principles	7
Field Procedures	7
PART III: GEOPHYSICAL TEST RESULTS	11
1990 Survey Results	11
1991 Survey Results	25
PART IV: DATA INTERPRETATION	35
PART V: CONCLUSIONS AND RECOMMENDATIONS	37
REFERENCES	38
APPENDIX A	A1

CONVERSION FACTOR, NON-SI TO SI (METRIC)
UNITS OF MEASUREMENT

Non-SI units of measurement used in this report can be converted to SI (metric) units as follows:

<u>Multiply</u>	<u>By</u>	<u>To Obtain</u>
feet	0.3048	metres
gamma	1.0	nanotesla
inches	2.54	centimetres
millimhos per foot	3.28	millimhos per metre

GEOPHYSICAL INVESTIGATION AT
PHILADELPHIA NAVAL SHIPYARD

PART I: INTRODUCTION

Background

1. Following the end of World War II, 50 to 60 pallets of gas cylinders were reportedly buried to the west of the old incinerator at Girard Point. The contents of the cylinders are unknown. Extensive filling operations occurred at Girard Point from 1940 to 1970, resulting in the cylinders, if they exist, being buried. The area has a relatively shallow groundwater surface in the area, two to ten feet deep, which would indicate that the cylinders are probably in direct contact with the water surface. Field investigations were conducted by the US Army Engineer Waterways Experiment Station (WES) at the Philadelphia Naval Shipyard (PNSY), Philadelphia, Pa., from 9 July through 13 July 1990, and 9 July through 25 July 1991 (the 1991 survey being done in conjunction with a cone penetrometer survey). The Geotechnical Laboratory (GL) undertook this work for the Environmental Office of PNSY. The investigation consisted of geophysical surveys performed by Mr. Michael K. Sharp of the Earthquake Engineering and Geosciences Division (EEGD), GL, WES. This report documents the results of the two investigations. The 1991 survey extended the 1990 grid to encompass a larger area as requested by personnel of the PNSY. Figure 1 shows the layout of both grids, with the 1990 survey grid displayed as small rectangles, and the 1991 survey grid displayed as small dots.

Scope

2. To aid in the assessment of the site, a geophysical survey program was planned and performed. The geophysical surveys were conducted to help delineate any anomalies indicative of buried waste, waste containers, and boundaries of burial trenches. The geophysical methods utilized at the site were electromagnetic induction (EM) using a Geonics EM-31 Terrain Conductivity System, and magnetics using an EDA OMNI IV Magnetometer. For the 1990 survey, both electromagnetic induction and magnetics were performed. However, for the 1991 survey only electromagnetic induction surveys were performed. This was due to the relatively poor data obtained from the magnetic survey performed in 1990. The best results for the site conditions were obtained using electromagnetic induction techniques.

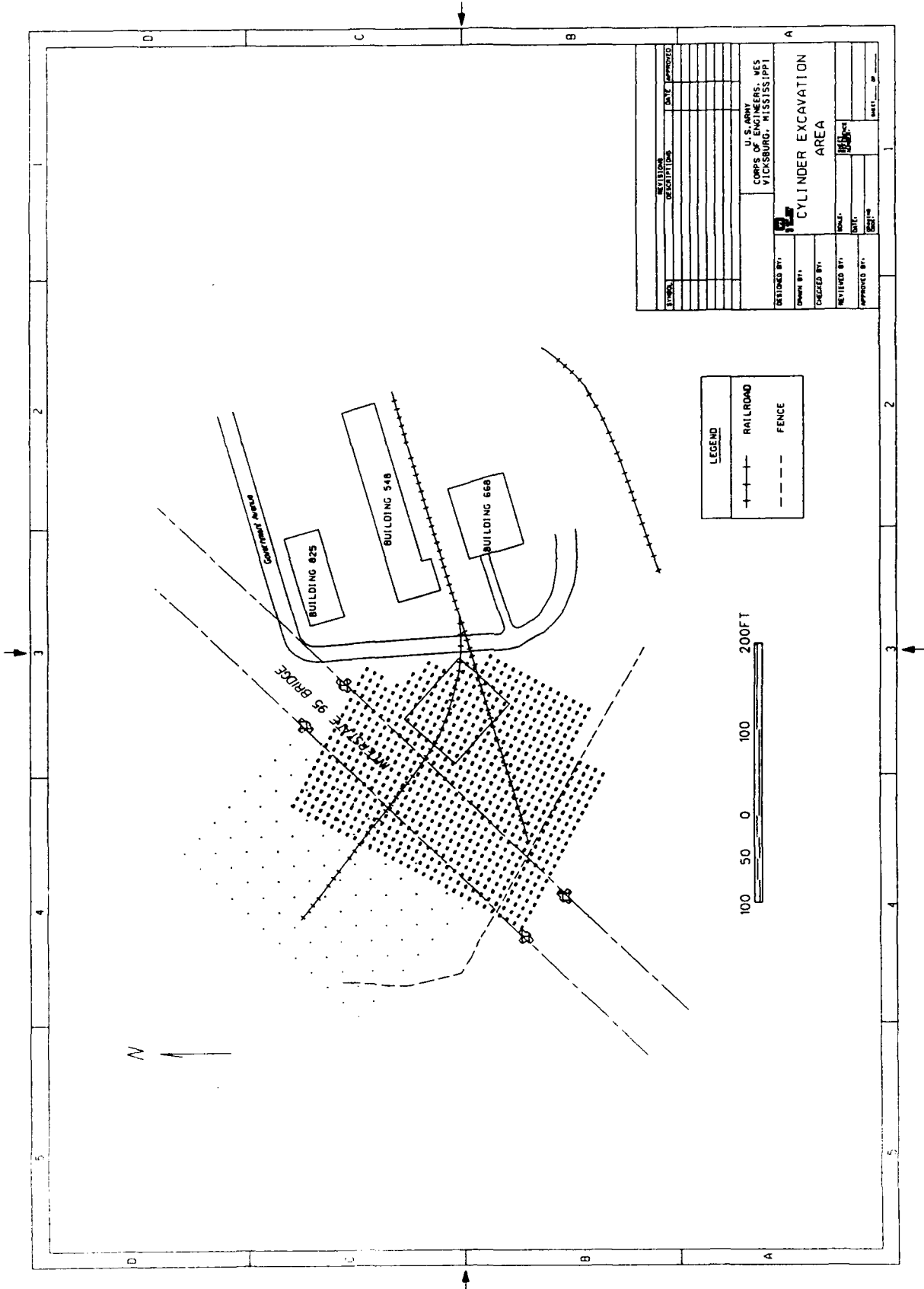


Figure 1. Layout of 1990 (small rectangles) and 1991 (small dots) survey grids.

PART II: GEOPHYSICAL TEST PRINCIPLES AND FIELD PROCEDURES

Electromagnetic Induction Principles

3. The EM-31 is an inductive electromagnetic device used to measure the earth's apparent ground conductivity. The responses are directly proportional to conductivity and inversely proportional to resistivity. The basic operation utilizes a transmitter coil (Tx) energized with an alternating current at an audio frequency and a receiver coil (Rx) located a short distance away. The time varying magnetic field arising from the alternating current in the transmitter coil induces currents in the earth. These currents generate a secondary magnetic field which is sensed, together with the primary field, by the receiver coil. In general, this secondary magnetic field is a complicated function of the intercoil spacing, the operating frequency, and the ground conductivity. Under certain constraints, called the low induction condition, the secondary magnetic field is a very simple function of these variables. Under these constraints, the ratio of the secondary to the primary field is linearly proportional to the terrain conductivity. The apparent conductivity indicated by the EM-31 depends on measurement of the secondary to primary field ratio and assumes low induction conditions. The units of conductivity are the mho (Siemen) per metre or, more conveniently, the millimho per meter.

4. There are two components of the induced magnetic field measured by the EM-31. The first is the quadrature-phase component which gives the ground conductivity measurement. The second is the in-phase component, which is used primarily for calibration purposes; however, the in-phase component is significantly more sensitive to large metallic objects and hence very useful when looking for buried metal containers. Experiments have indicated that the EM-31 can detect a single 45 gal oil drum at a depth of about 12 ft (3.7m) using the in-phase component of the meter. When taking measurements with the instrument in the in-phase mode (magnetic readings), the readings are obtained in parts per thousand (ppt). Each reading is taken as the deviation from a preset zero value in ppt (could be anything that would allow positive and negative deviations).

5. The EM-31 has an intercoil spacing of 12 ft (3.7m) and has an effective depth of exploration of about 20 ft (6 m). The EM-31 meter reading is a weighted average of the earth's conductivity as a function of depth. A thorough investigation to a depth of 13 ft (4 m) is possible, but below that depth the effect of conductive anomalies becomes more difficult to distinguish as their depth increases. The instrument can be operated in both a horizontal and vertical orientation which changes the effective depth of exploration. The instrument is normally carried such that the transmitter and receiver coils are oriented vertically, which gives the maximum penetration depth. It can be used in either a discrete or continuous-read mode.

Magnetic Principles

6. The magnetic survey was performed utilizing a proton precession magnetometer (Telford et al, 1973) and the EM-31 Terrain Conductivity System operating in the In-Phase mode. The proton precession magnetometer measures the absolute value of the total magnetic field intensity with an accuracy of 1 gamma (or 1 nanotesla, nT), in the earth's field of approximately 50,000 gammas. The total magnetic field intensity is a scalar measurement of the magnitude of the earth's field vector independent of its direction. The total field is a vector sum of the earth's main field and any local anomalous field component in the direction of the main earth's field.

7. Magnetic anomalies in the earth's magnetic field are caused by two different kinds of magnetism, induced and remanent (permanent) magnetization. Induced magnetization refers to the action of the field on subsurface material, wherein the ambient field is enhanced or diminished depending on the magnetic properties of the material. The resulting magnetization is directly proportional to the intensity of the ambient field and to the magnetic susceptibility of the material. The remanent or permanent magnetization is often the predominant magnetization in many igneous rocks and iron alloys. Permanent magnetization depends upon the metallurgical properties and the thermal, mechanical, and magnetic history of the specimen. This type of magnetism is independent of the field in which it is measured (Breiner 1973).

8. A magnetic anomaly represents a local disturbance in the earth's magnetic field which arises from a localized change in magnetization, or magnetization contrast. The observed anomaly expresses the net effect of the induced and remanent magnetization and the earth's field which usually have different directions and intensities of magnetization. Depth of detection of a localized subsurface feature depends on mass, magnetization, shape and orientation, and state of deterioration of the feature.

Field Procedures

9. The surveys were initiated by establishing a grid over the areas of interest. The placement of the grid for the 1990 survey was determined from conversations with personnel of PNSY. The placement of the 1991 survey grid was determined from conversations with PNSY personnel and the geophysical survey performed by the WES in 1990. The 1990 grid is shown in Figure 2, the 1991 grid is shown in Figure 3. The grids were established with stakes (non-conducting and non-metallic) on twenty (1990 grid) and twenty-five (1991 grid) foot centers. The grid, as shown in Figure 2, is 260 ft by 300 ft with data collected on 10 ft centers. The grid, as shown in Figure 3, is 200 ft by 300 ft with data collected from each test on 12.5 ft centers, producing more than adequate coverage of the site.

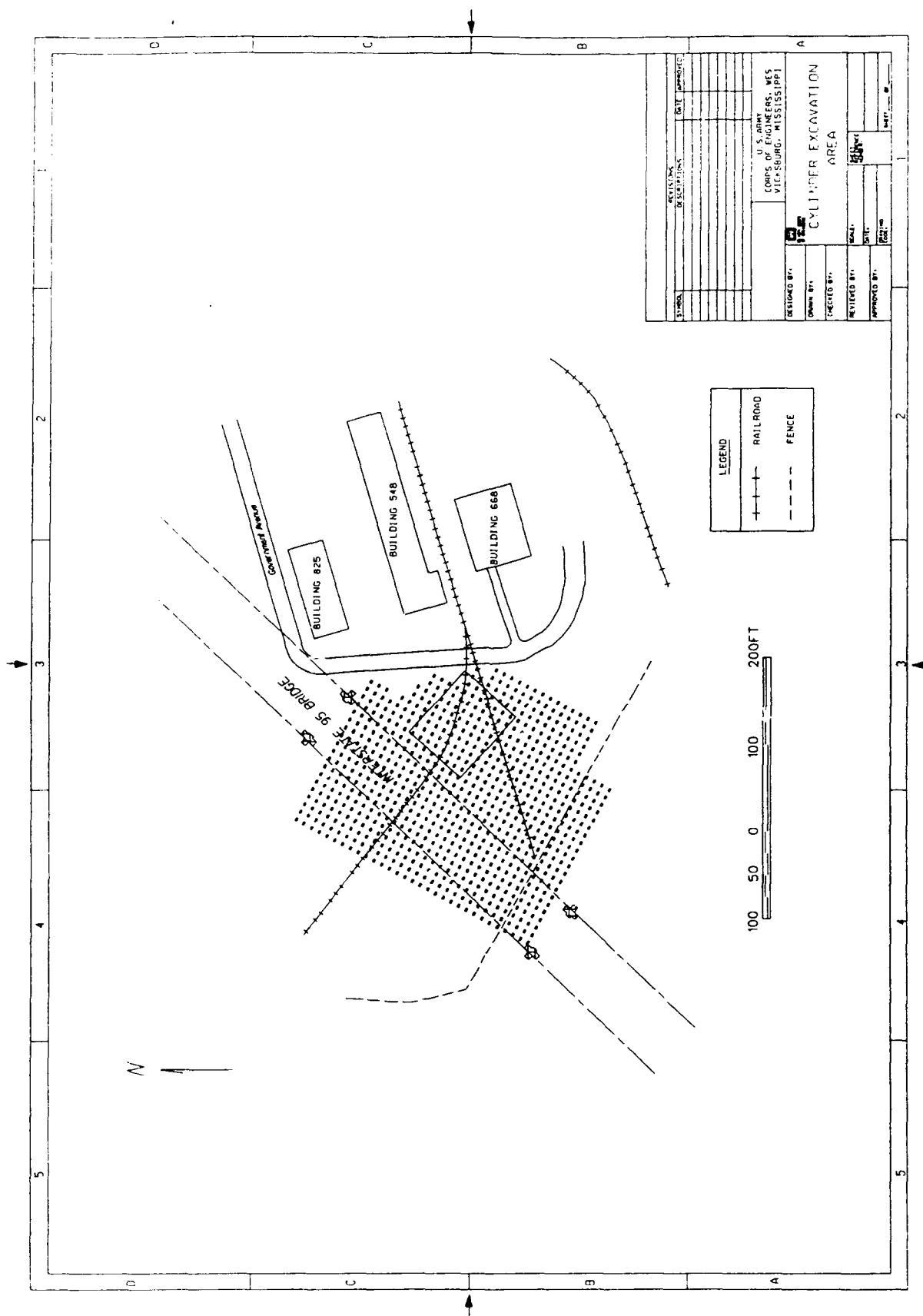


Figure 2. Layout of 1990 survey grid.

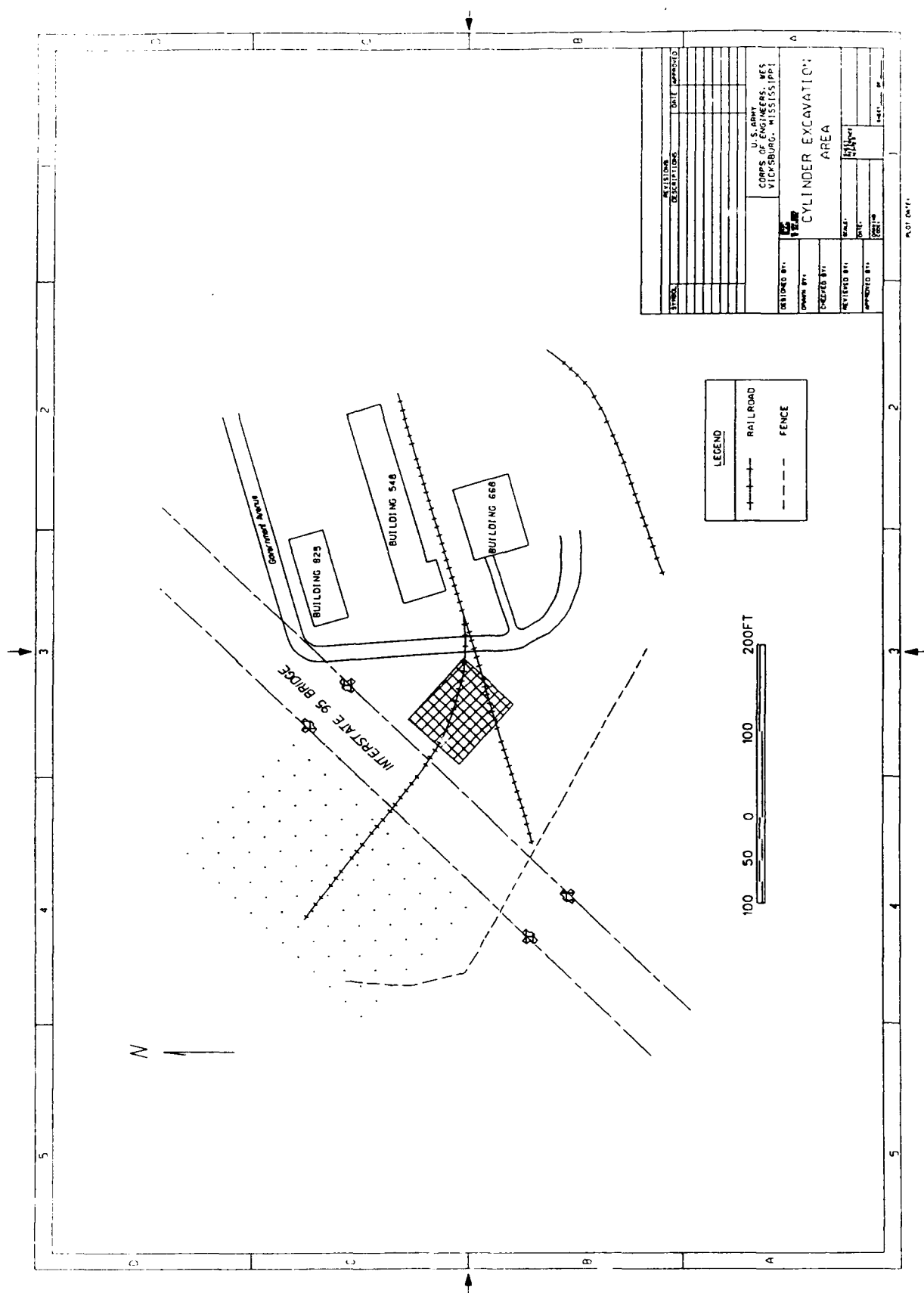


Figure 3. Layout of 1991 survey grid.

10. All data collected was stored in memory of the recording device and transferred to a portable computer for processing at the end of the day. There were approximately 730 data points collected for each test procedure from the 1990 grid and 340 points of data collected from each test procedure for the 1991 grid. The data were gridded and contoured such that diagrams of the results could be displayed.

PART III: GEOPHYSICAL TEST RESULTS

1990 Survey Results

Conductivity Results

11. A detail layout of the grid established for the 1990 survey is shown in Figure 4. The results of the conductivity survey are shown in Figures 5 through 7. The conductivity values in mmhos/m, as collected in the field, are shown in Appendix A. Figure 5 is a profile plot of the data, connected with a continuous line and slightly exaggerated. From this figure three areas can be seen to be significantly different from the background. The area from (75N,210W) trending to the northwest, which is being caused by a chainlink fence, and the area centered around (125N,25W), which is being caused by a concrete slab, are both results of known surface features. However, the rectangular area with coordinates (25N,40W), (90N,40W), (90N,150W), and (25N,150W) is not produced by a surface feature and will be considered anomalous. The data has been contoured, with a contour interval of 20 mmhos/m and presented in Figure 6. Here again, the anomalous areas are identified and clearly visible. Figure 7 is a combination of the survey locations, contoured data, and color gridded data. The values range from -100 mmho/m to 400 mmho/m. From Figure 7 the three areas discussed previously are easily discernable from the relatively quiet background values.

Magnetic Results

12. The results of the magnetic survey are shown in Figures 8 through 13. Figures 8 through 10 show the results of the EM-31 survey, Figures 11 through 13 show the results of the magnetometer survey. The results from both techniques are presented as described in paragraph 11, with the data shown in Appendix A. Comparing the results from the different survey techniques, it is apparent that the magnetometer survey could not clearly distinguish any particular area as anomalous. The values range from 47000 gammas to 59000 gammas. The entire site appears to be anomalous, resulting from the noisy conditions at the site. The magnetometer is being influenced by the cultural features in the area (bridge, buildings, fence, etc.) to such an extent that any meaningful data are being lost in the noise. This is not the case with the EM-31 data, since the instrument is only influenced by those objects within 20 ft. The values range from -100 to 300 ppt. The EM-31 magnetic data agrees almost identically with the conductivity data. The same three areas discussed in the conductivity results section are clearly seen in Figures 8 through 10. The large unknown anomalous area is a magnetic high as well as a conductive high.

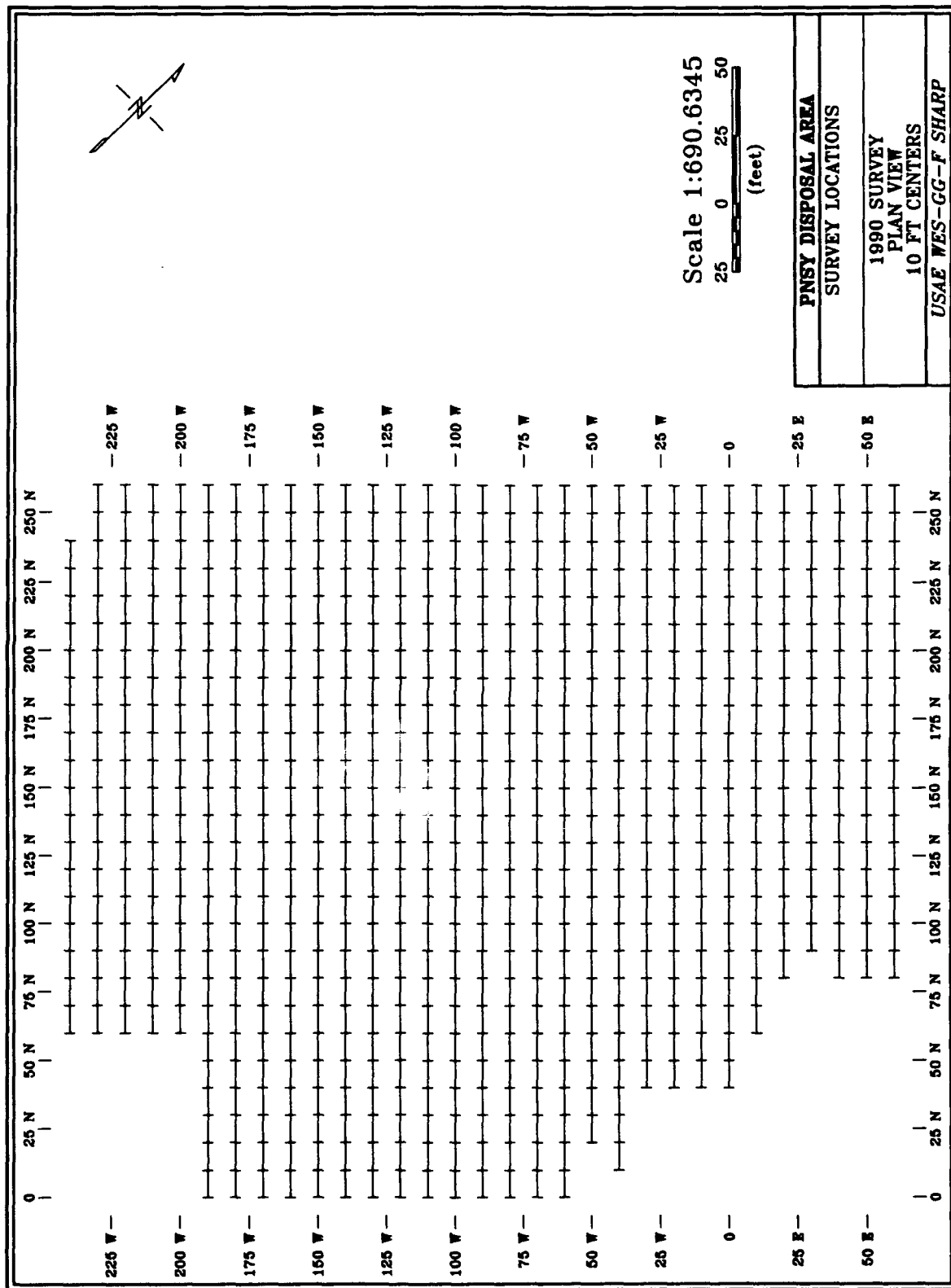


Figure 4. Detail layout of survey locations for 1990 survey grid.

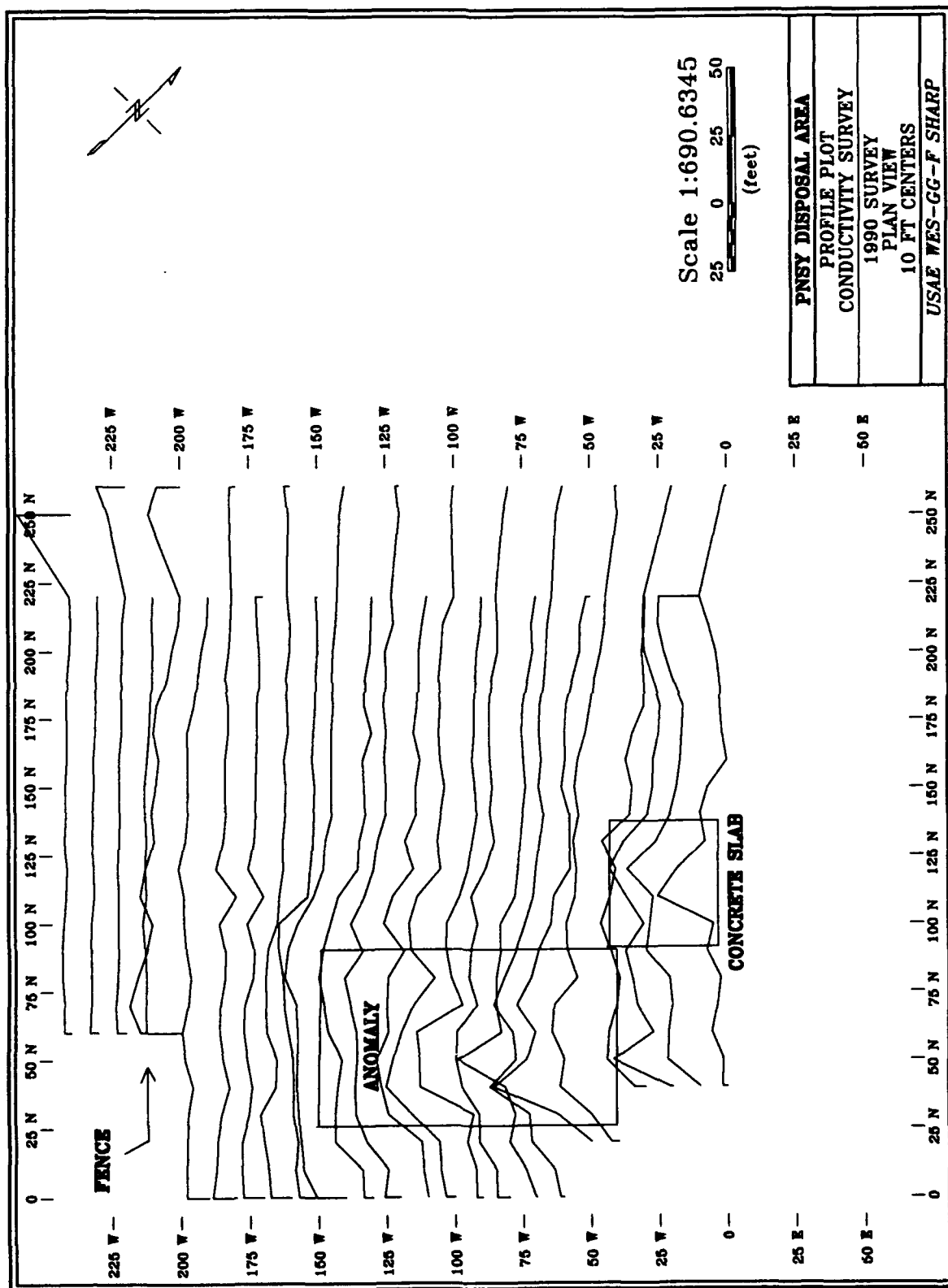


Figure 5. Profile plot of conductivity measurements in mmho/m for 1990 survey.

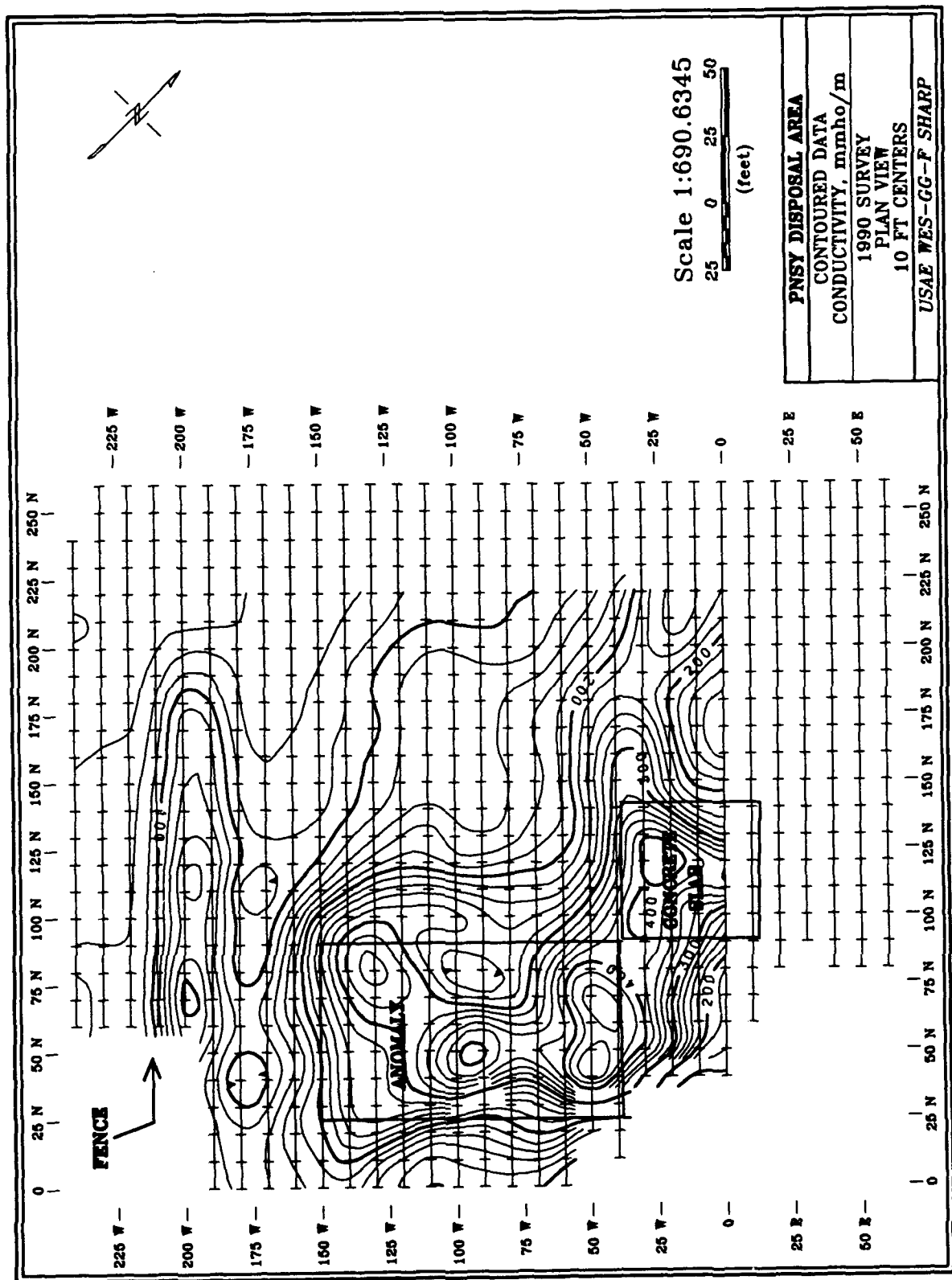


Figure 6. Plot of contoured conductivity data for 1990 survey, 20 mmho/m contour interval.

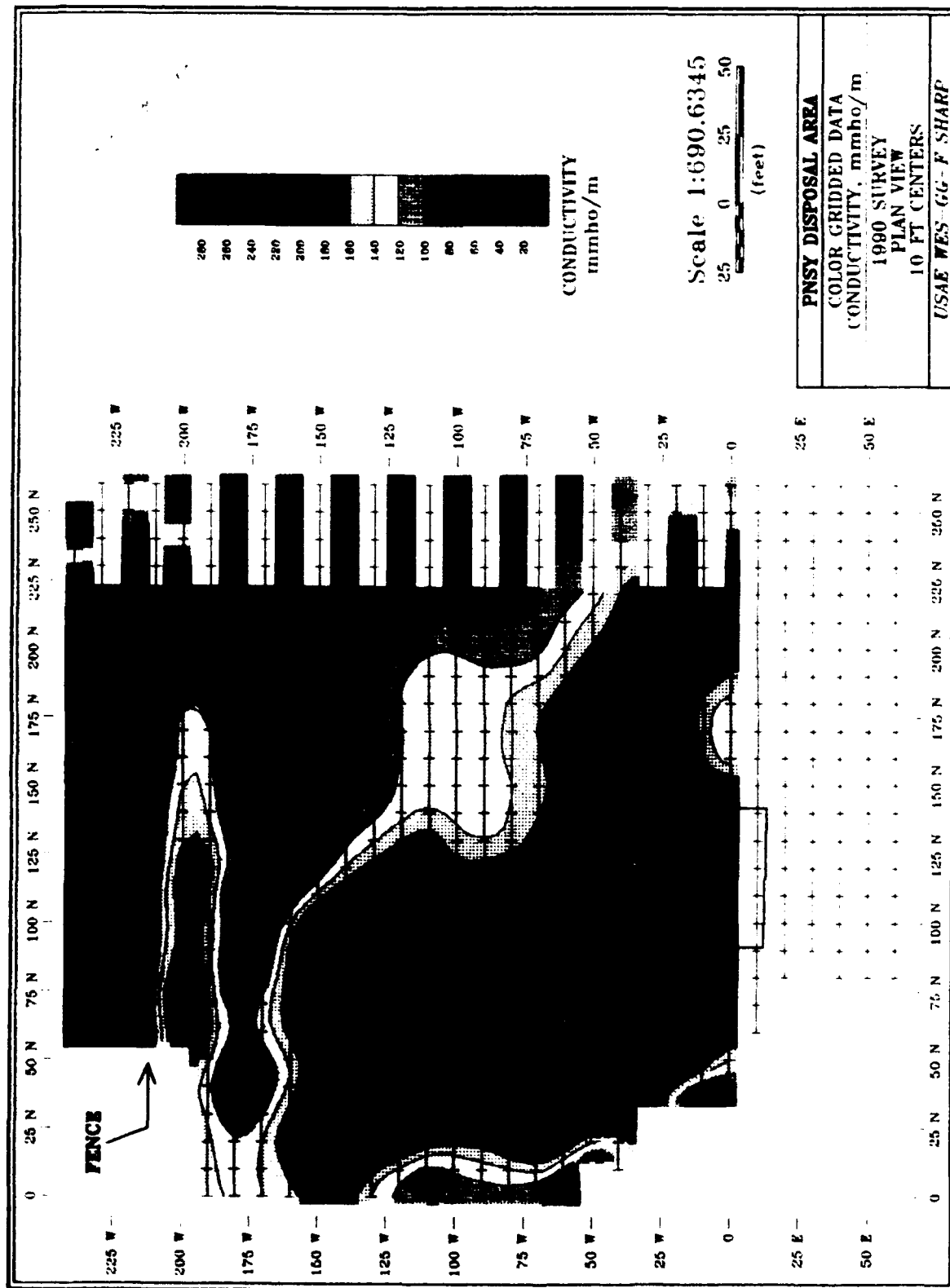


Figure 7. Plot of color gridded conductivity data for 1990 survey, 20 mmho/m contour interval.

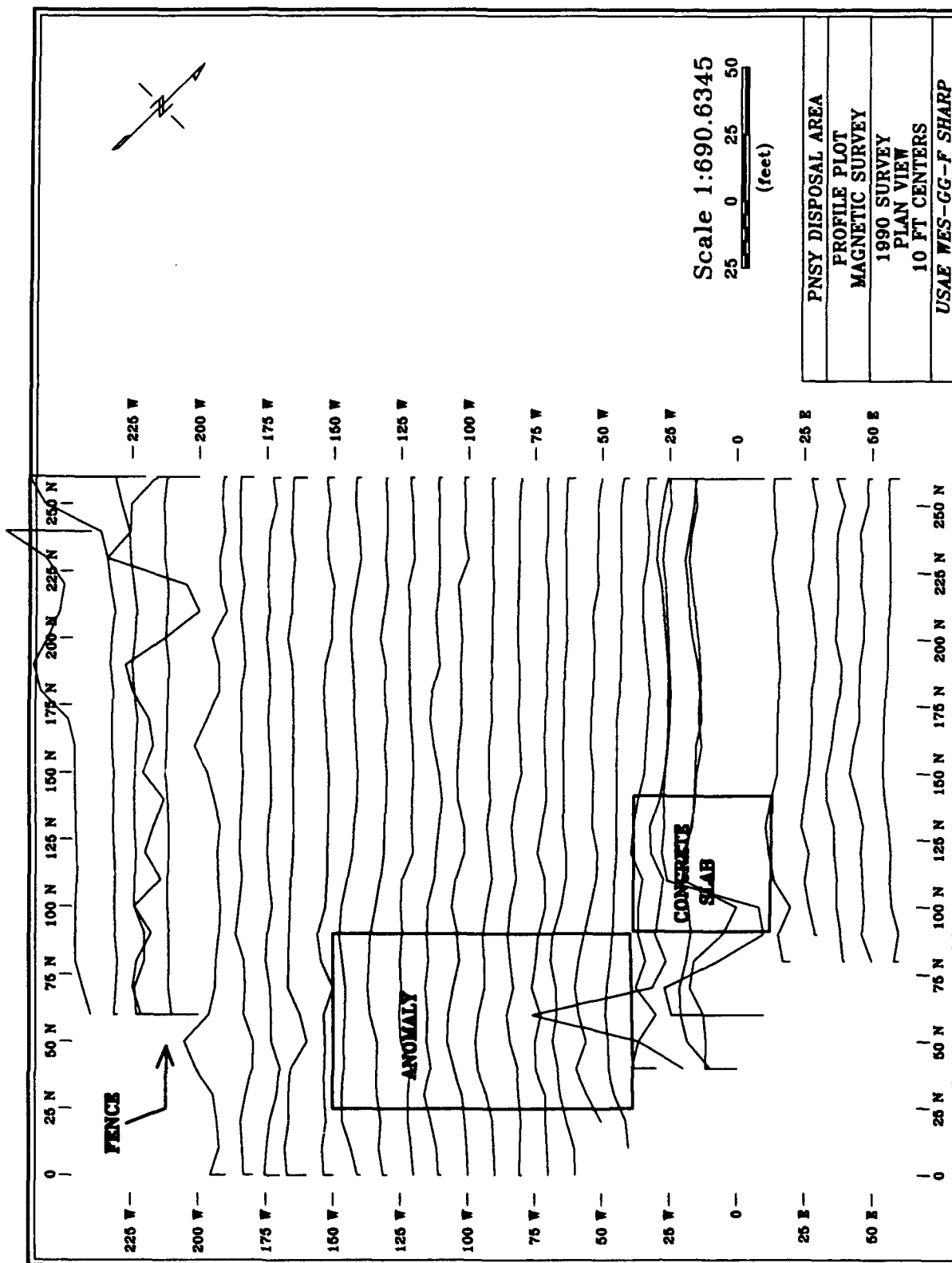


Figure 8. Profile plot of magnetic data in ppt for 1990 survey.

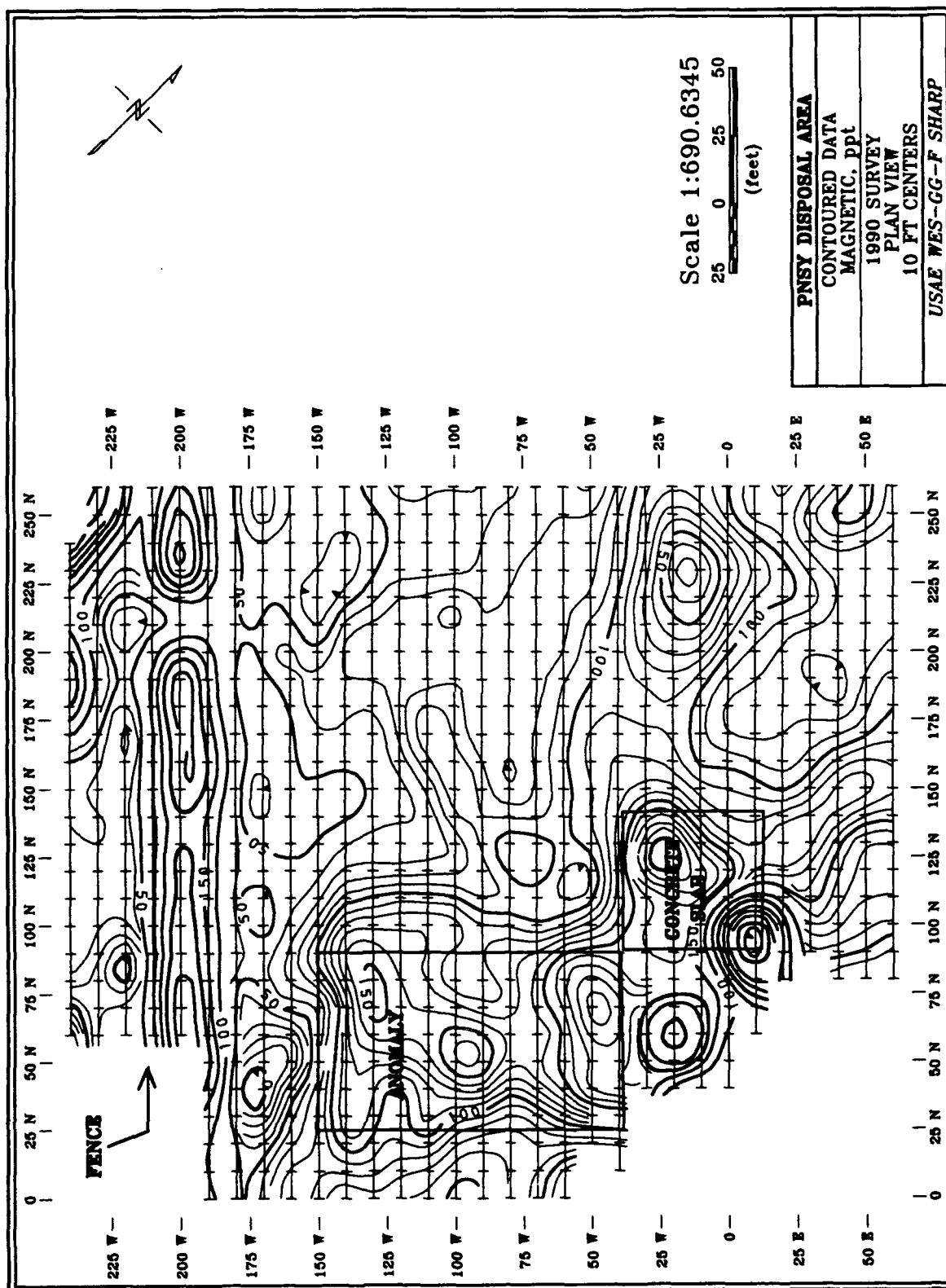


Figure 9. Plot of contoured magnetic data for 1990 survey, 10 ppt contour interval.

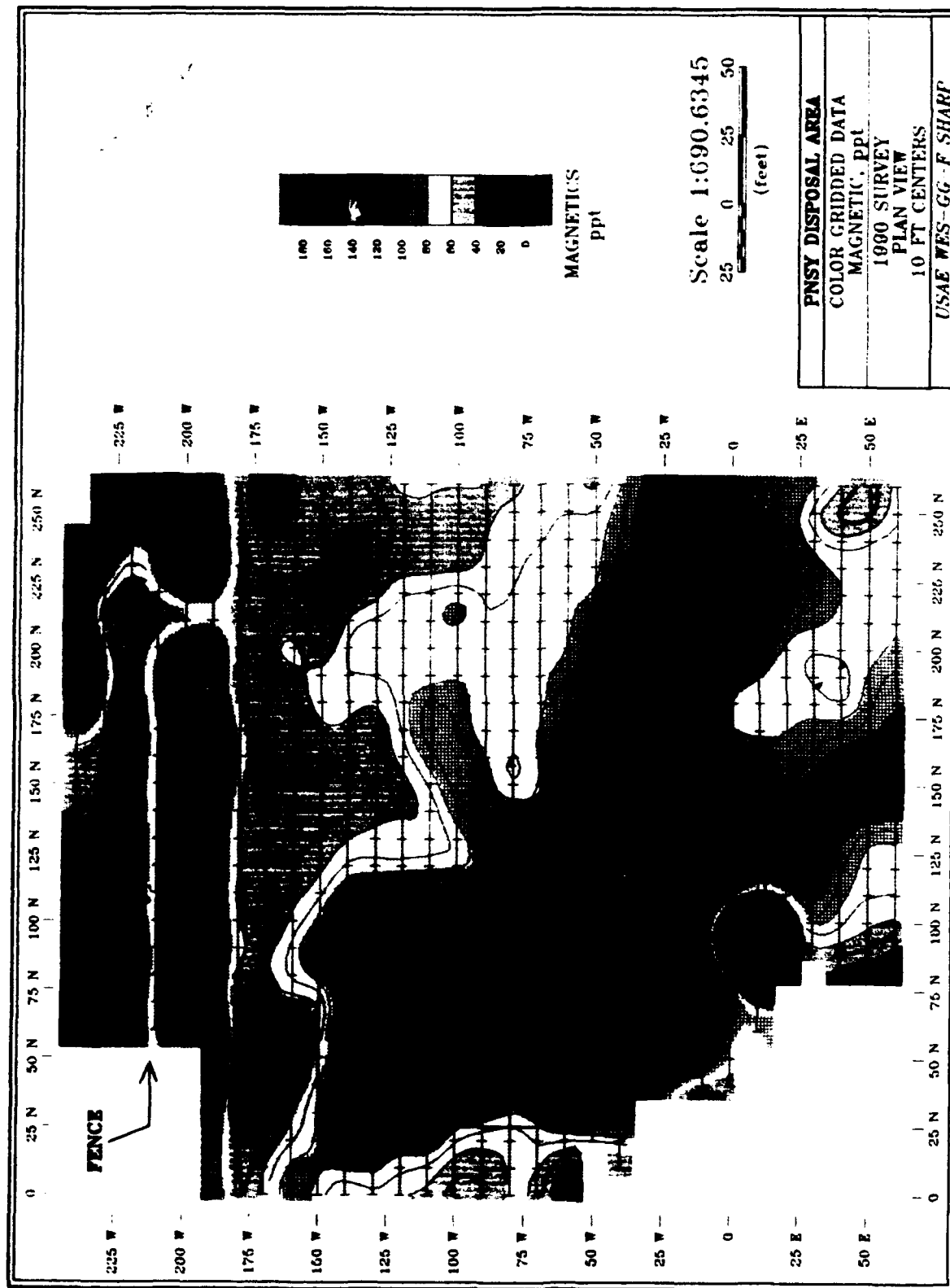


Figure 10. Plot of color gridded magnetic data for 1990 survey, 10 ppt contour interval.

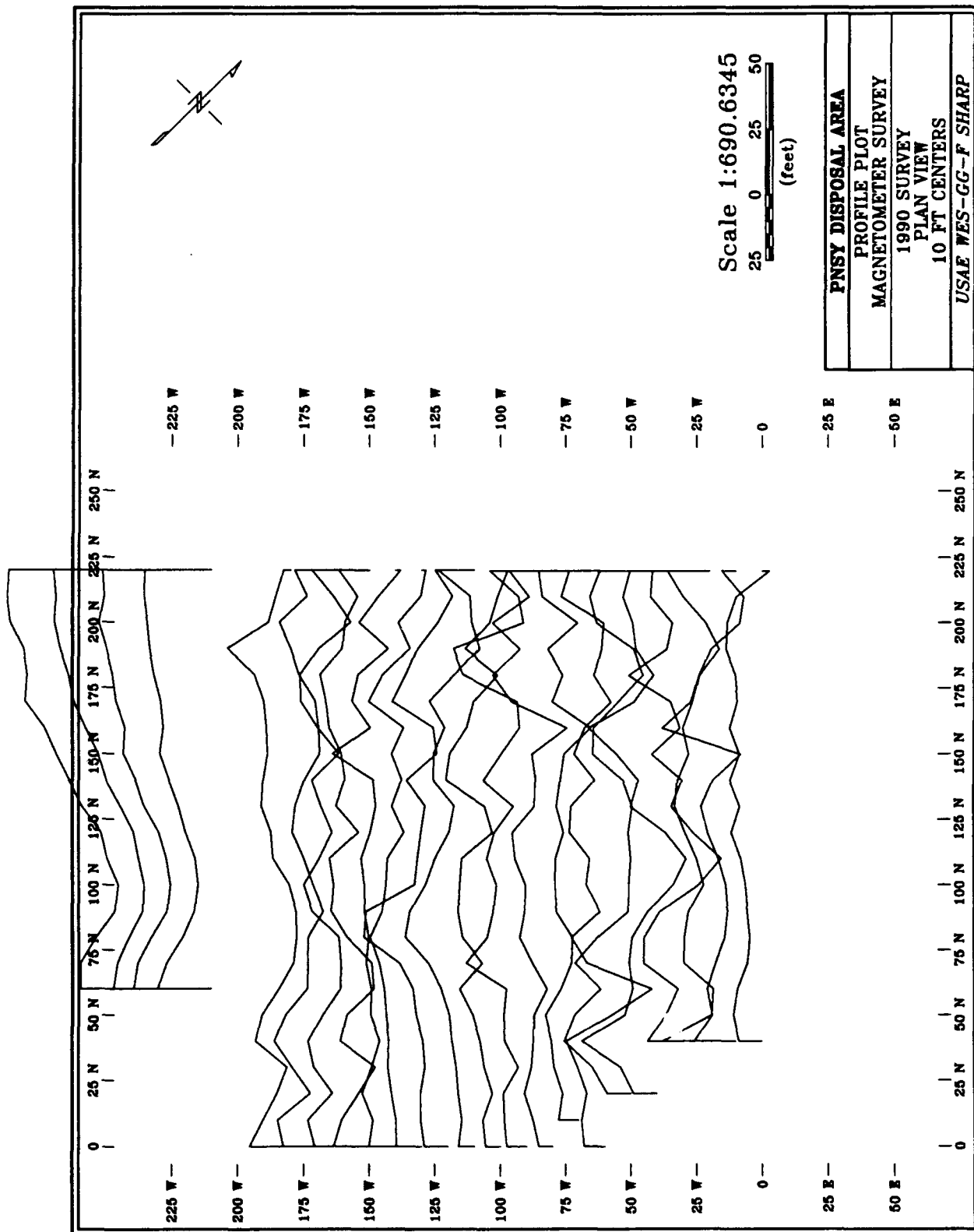


Figure 11. Profile plot of magnetometer data in gammas for 1990 survey.

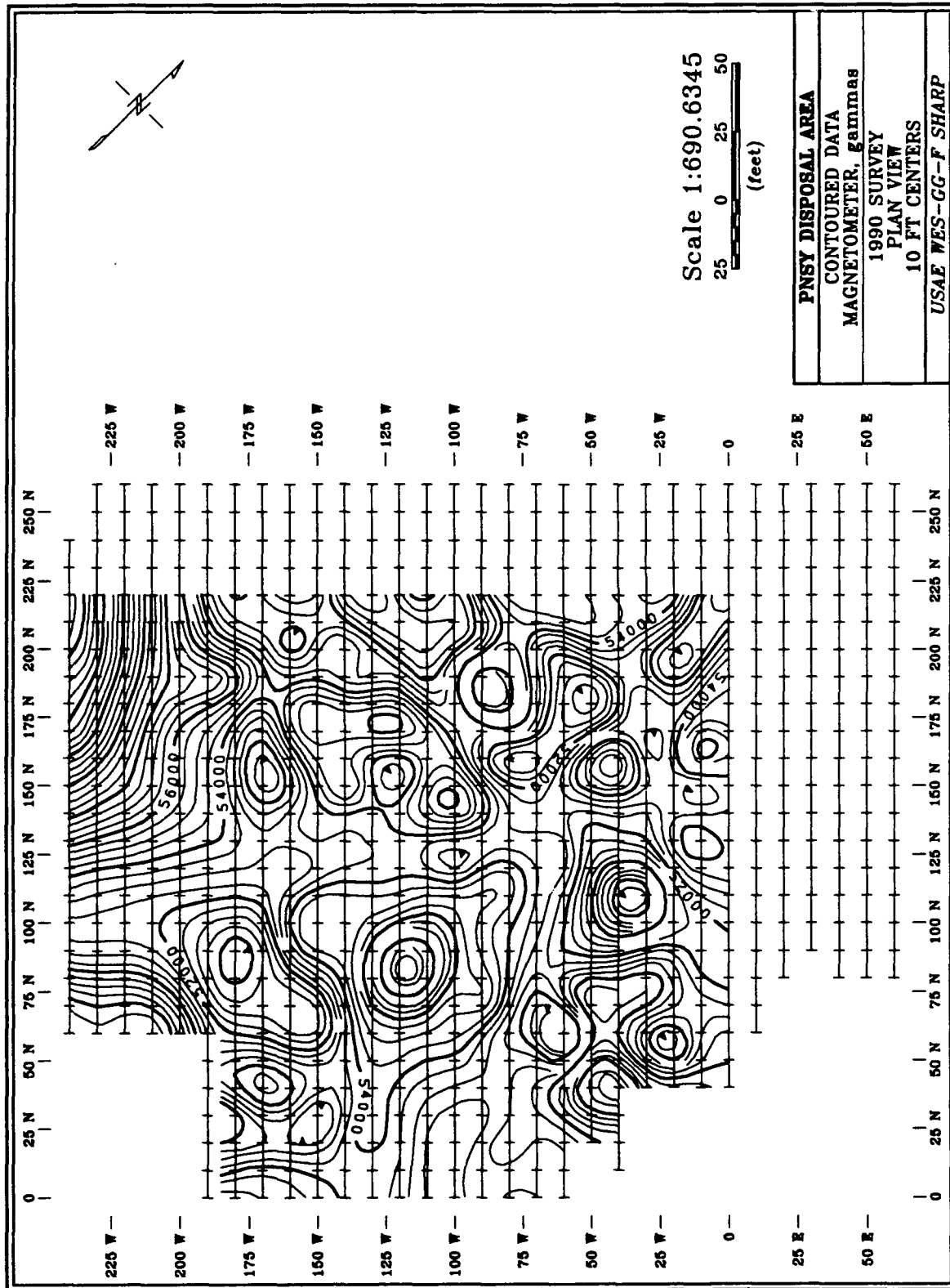


Figure 12. Plot of contoured magnetometer data for 1990 survey, 500 gamma contour interval.

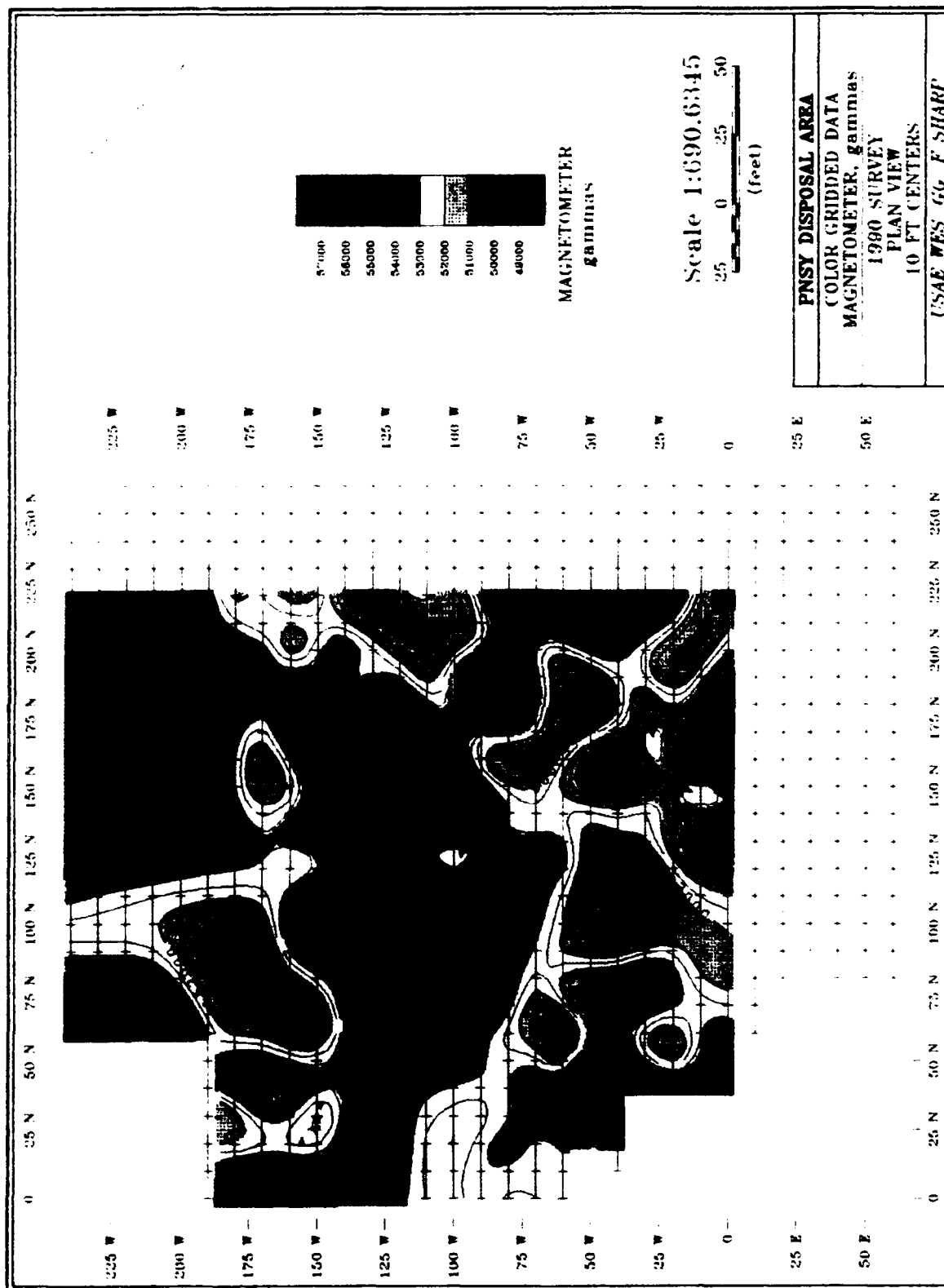


Figure 13. Plot of color gridded magnetometer data for 1990 survey, 500 gamma contour interval.

1991 Survey Results

Conductivity Results

13. A detailed layout of the survey locations for the 1991 survey is shown in Figure 14. The results of the conductivity survey are presented in Figures 15 through 17. The actual conductivity values in mmhos/m, as collected in the field, are shown in Appendix A. Figure 15 is a profile plot of the data, in which the data has been connected with a continuous line and slightly exaggerated. The data has been contoured, with a contour interval of 5 mmhos/m, and presented in Figure 16. From these figures, it is clear that there is a trend running through the grid from station (0,0) westward. This would indicate the area where burial and filling operations might have occurred. The highest conductivity values are in the general area of station (50N,100W) and station (150N,100W). Figure 17 is a combination of the survey locations, contoured data, and color gridded data, with values ranging from 0 mmhos/m to over 175 mmhos/m. From this figure, the areas of high conductivity are quite obvious, as is the westward trend.

Magnetic Results

14. The results of the magnetic survey are shown in Figures 18 through 20. Magnetic data was collected with the EM-31 only, with no magnetic data collected with the magnetometer. This was determined from the extremely noisy conditions at the site producing poor results from the 1990 magnetometer survey. The data is shown in Appendix A, and Figure 18 shows the profile plot. Here, as was seen in the conductivity profile, magnetic disturbances trend westward through the grid from station (0,0). The contoured data is presented in Figure 19, with a contour interval of 1 ppt. The highest magnetic anomaly is centered around station (175N, 90W). Figure 20 is a combination of the survey locations, contoured data, and color gridded data. From this figure the westward trend and high at station (175N,90W) is clearly visible.

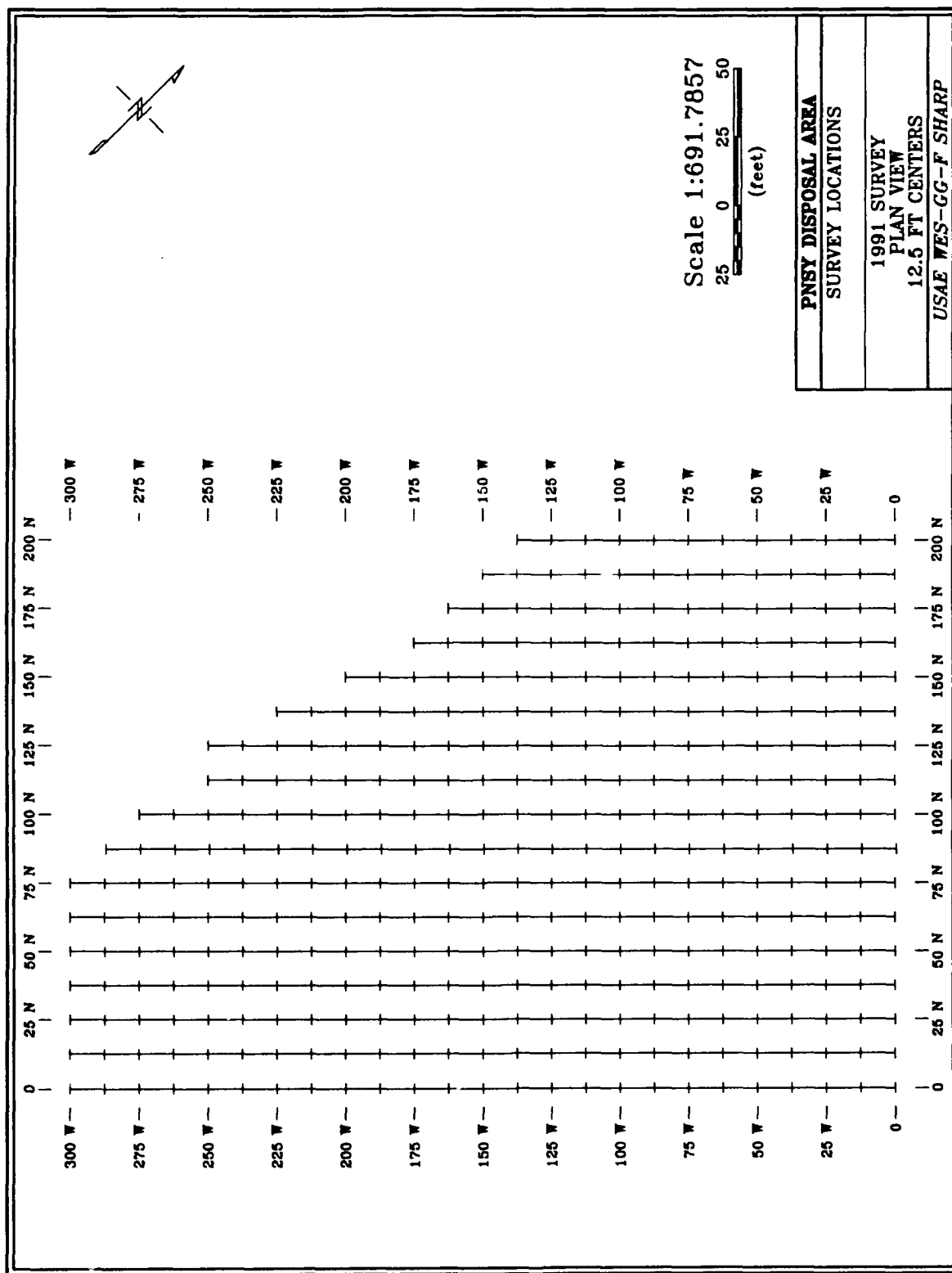


Figure 14. Detail layout of survey locations for 1991 survey grid.

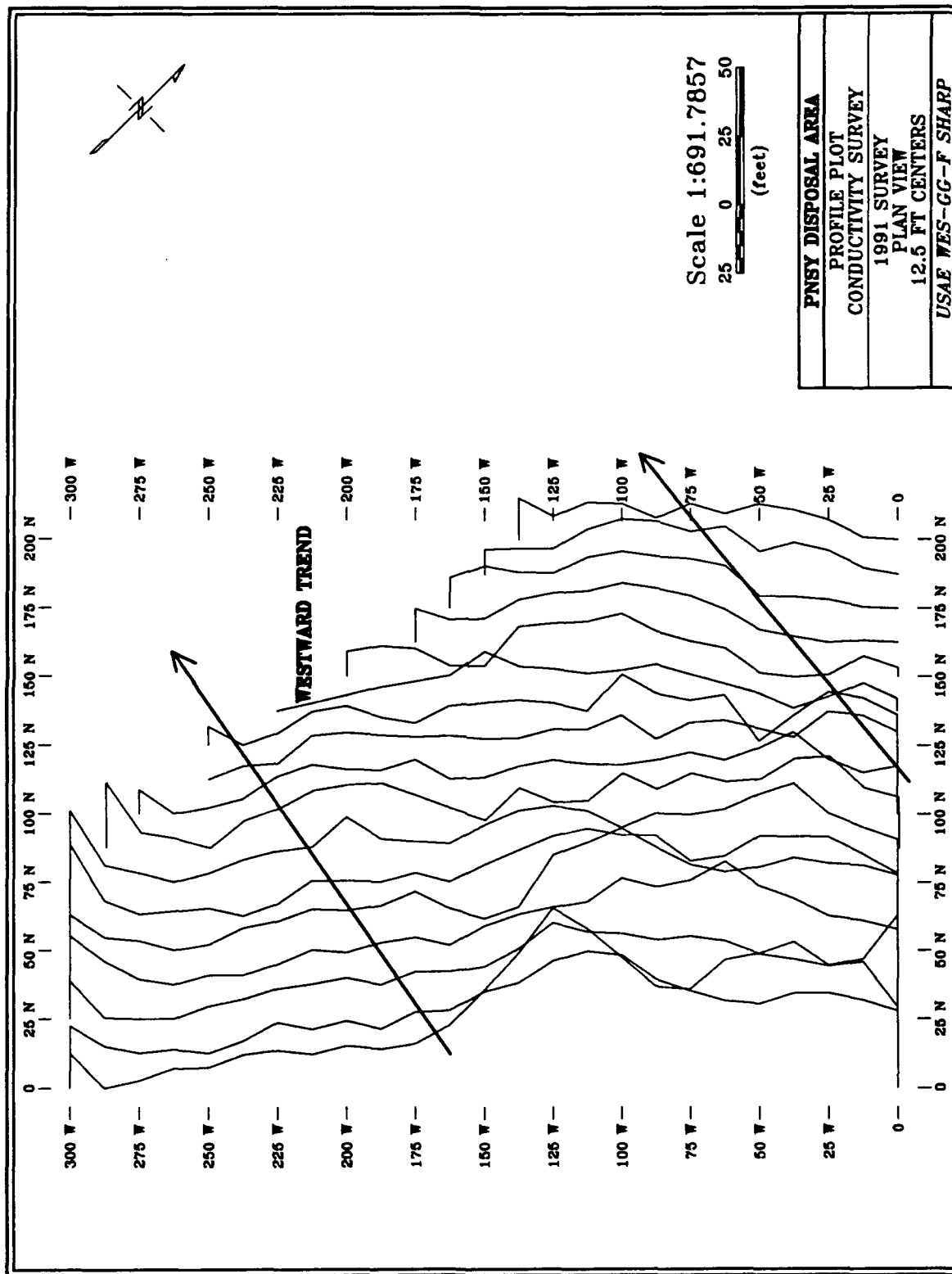


Figure 15. Profile plot of conductivity data in mmho/m for 1991 survey.

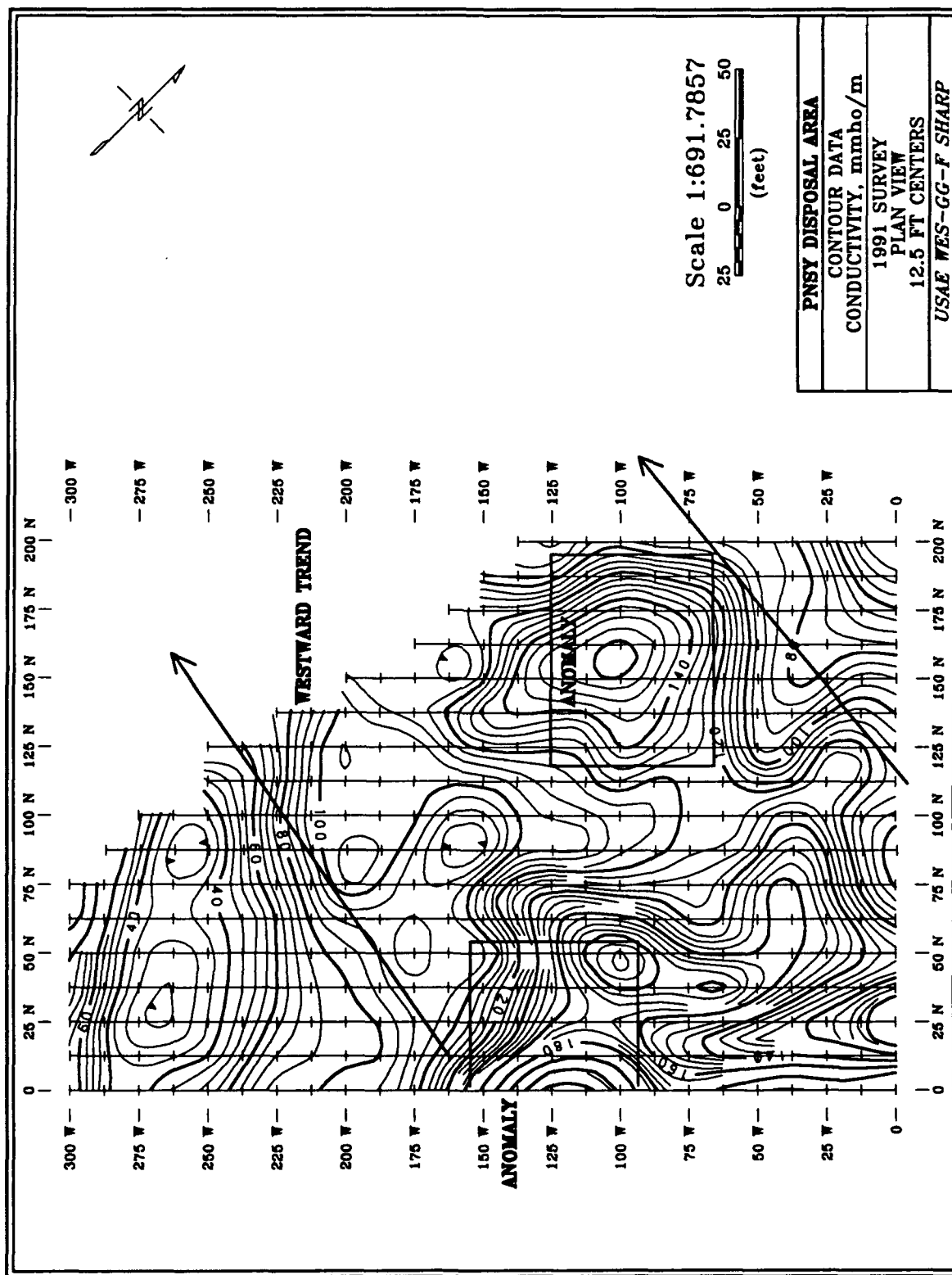


Figure 16. Plot of contoured conductivity data for 1991 survey, 5 mmho/m contour interval.

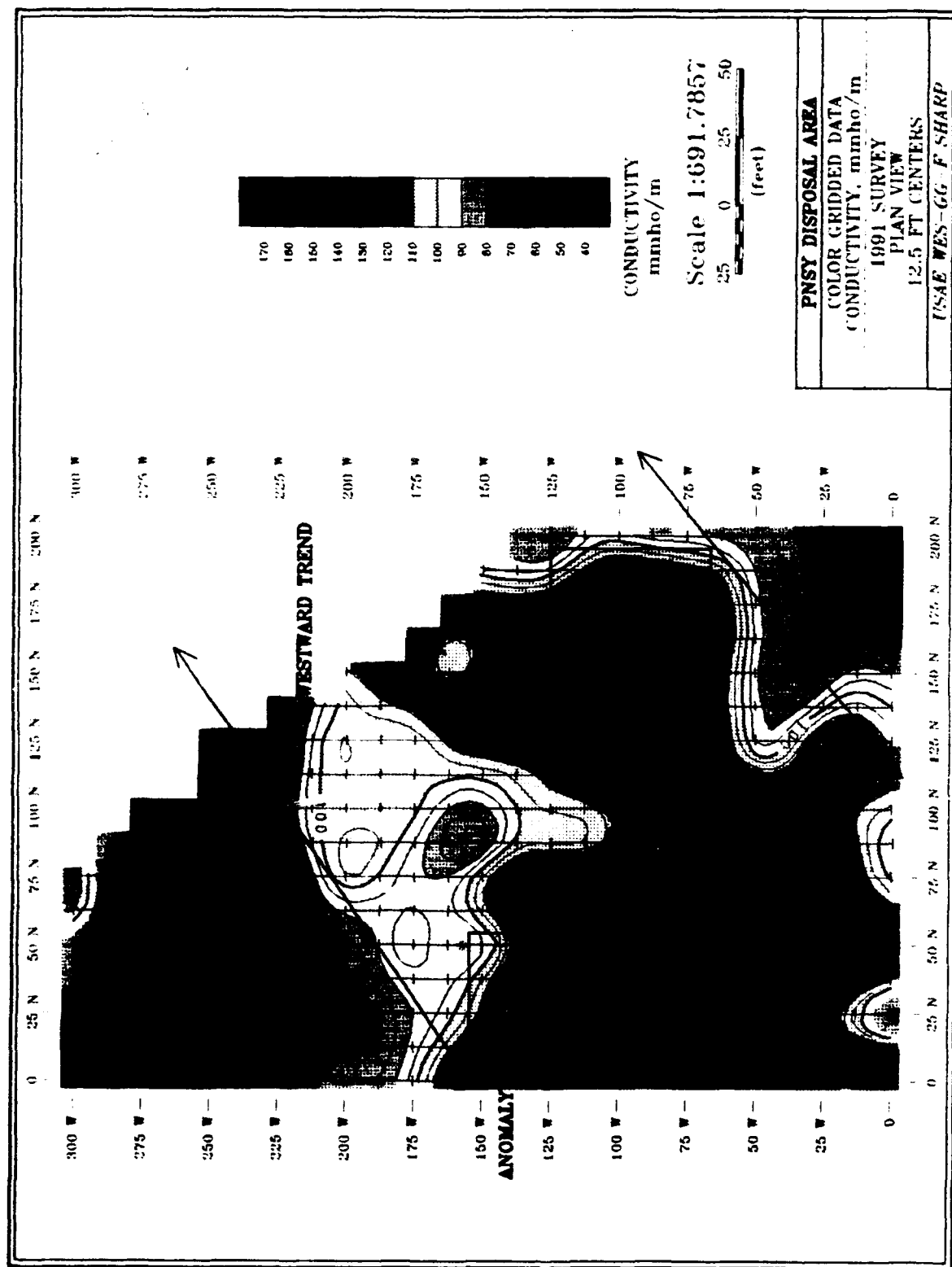


Figure 17. Plot of color gridded conductivity data for 1991 survey, 5 mmho/m contour interval.

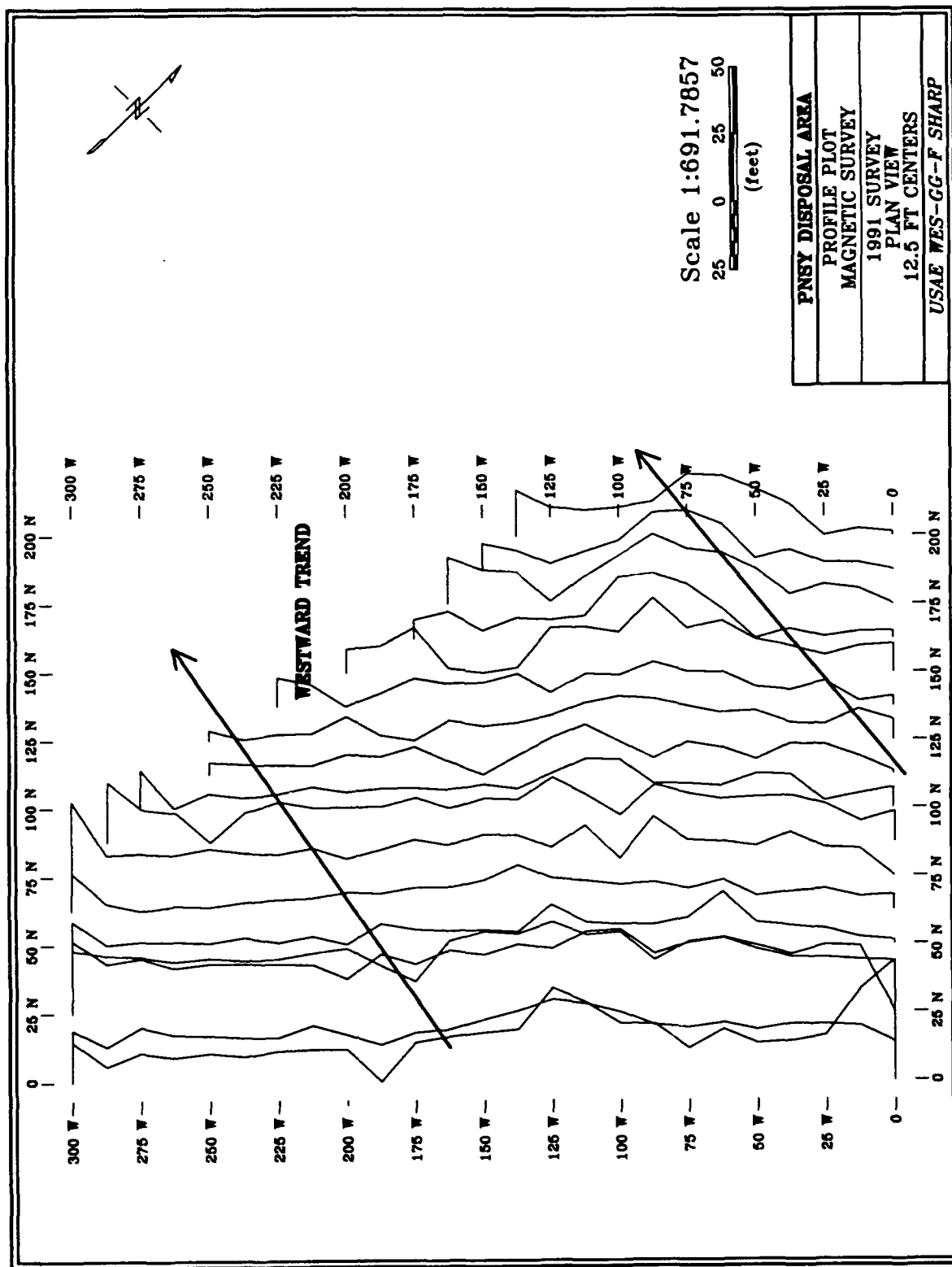


Figure 18. Profile plot of magnetic data in ppt for 1991 survey.

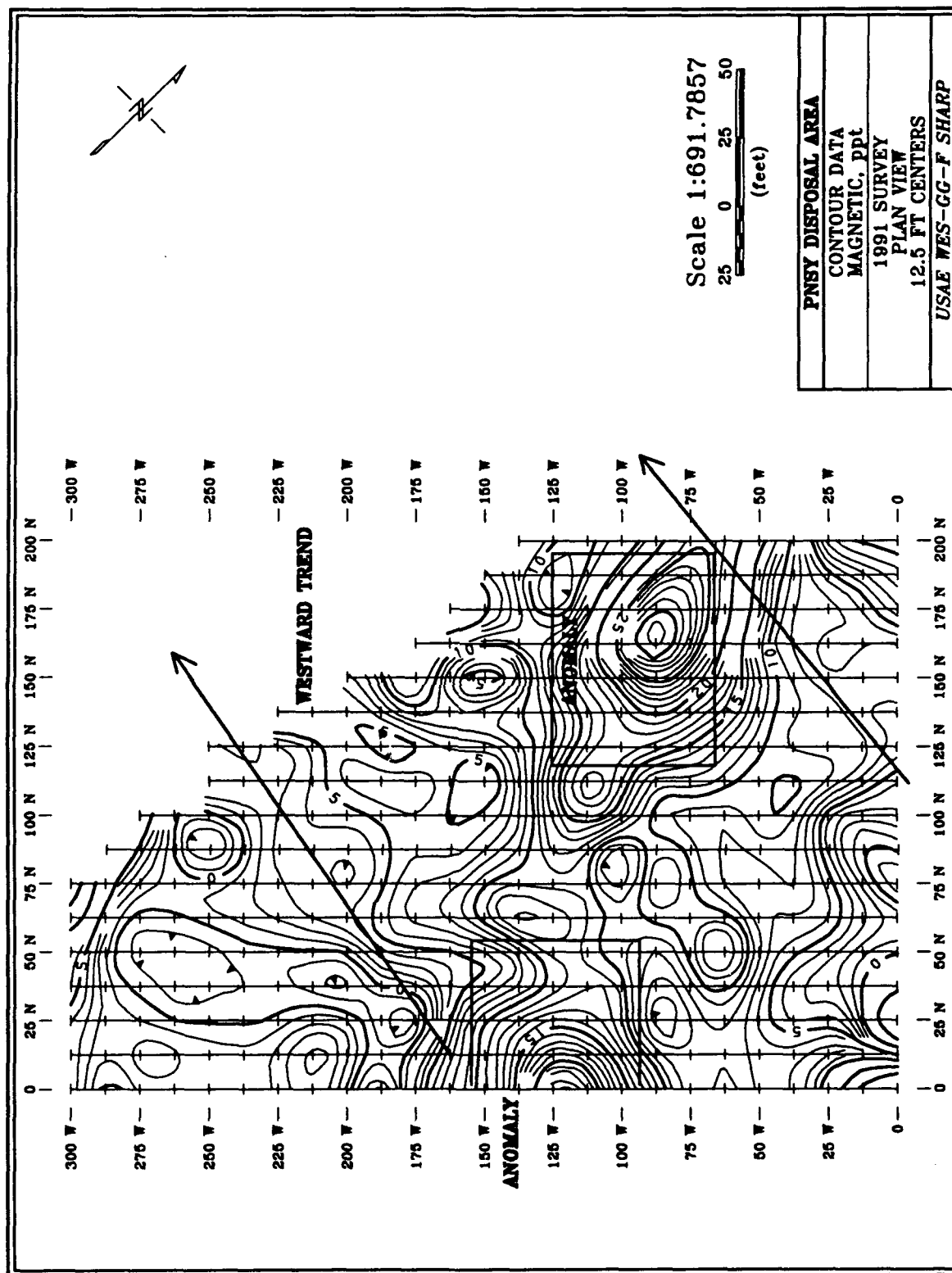


Figure 19. Plot of contoured magnetic data for 1991 survey, 1 ppt contour interval.

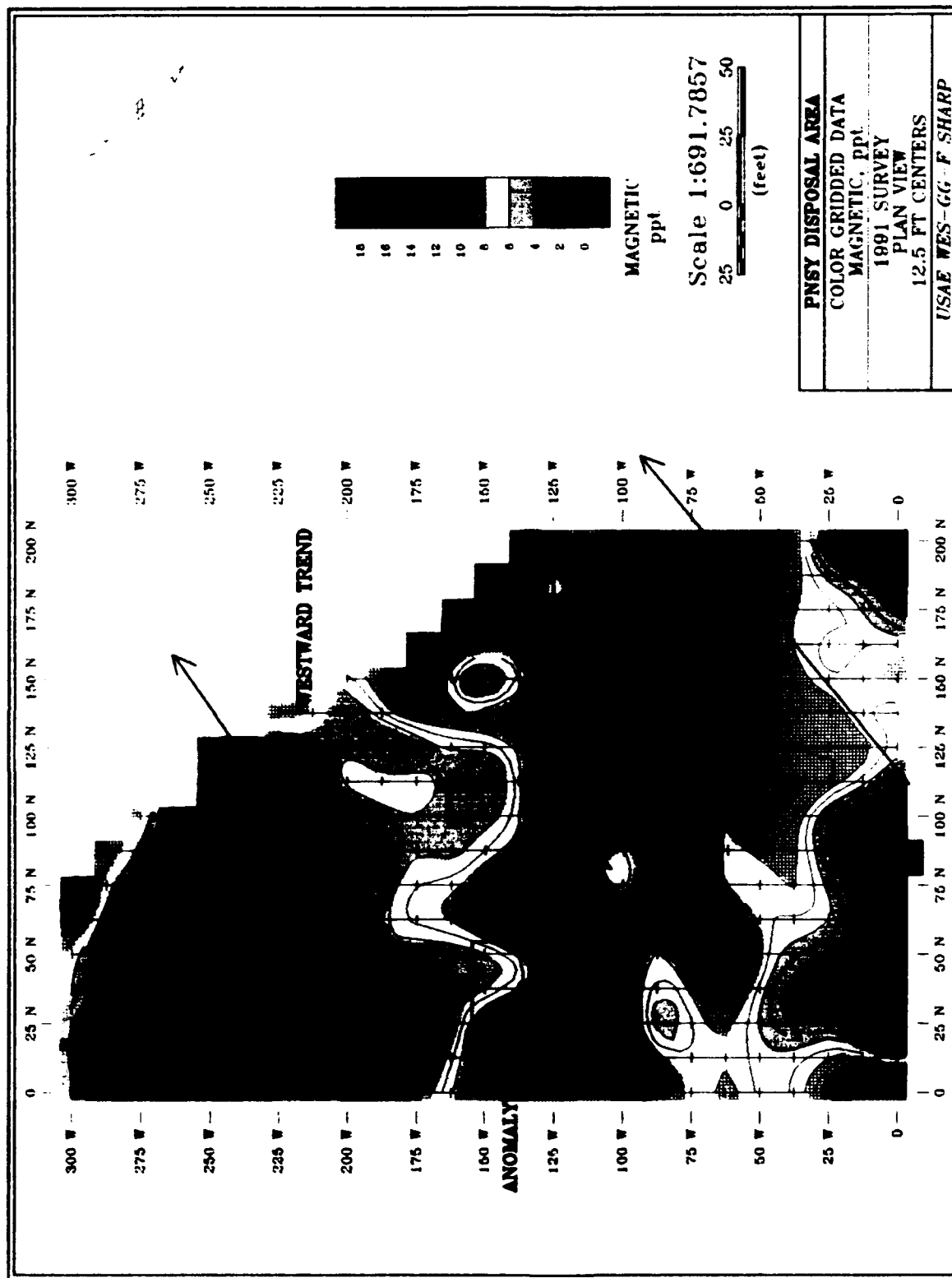


Figure 20. Plot of color gridded magnetic data for 1991 survey, 1 ppt contour interval.

PART IV: DATA INTERPRETATION

15. In determining which of the anomalous areas from each of the various tests are significant, several factors must be considered. Anomaly detection is limited by instrument accuracy and local "noise" or variation in the measurements caused by factors not associated with the anomalies of interest. For an anomaly to be significant, it must be two to three times greater than these factors. Since the anomaly amplitude and spatial extent (wavelength) are the keys to detection, the size and depth of the feature causing the anomaly are very important factors in determining detectability and resolution. The intensity of the anomaly is also a function of the degree of contrast in material properties between the anomaly and the surrounding material. Based upon the methods employed, noise conditions at the site and the assumption that the target objects are relatively shallow (less than 15-ft or 4.6 m), the areas indicated as anomalous can be considered significant. In the interpretation of the results, the following criteria were utilized and only refer to anomalies related to magnetic susceptibility and conductivity. Magnetic lows are not included in the criteria since they are associated with either a magnetic high or an above ground object. The criteria for anomaly interpretation are:

- Magnetic High and Conductivity High
Buried metallic objects; possible conductive contaminant waste plume.
- Magnetic High and Conductivity Neutral
Buried metallic objects, too small or too deep to affect the conductivity measurements.
- Magnetic High and Conductivity Low
Buried metallic objects; no conductive contaminant waste plume, but some geologic condition producing low conductivity.
- Magnetic Neutral and Conductivity High
No buried metallic objects; possible conductive contaminant waste plume.
- Magnetic Neutral and Conductivity Low
No buried metallic objects; no conductive contaminant waste plume, but some geologic condition producing low conductivity.
- Magnetic Neutral and Conductivity Neutral
No anomalous conditions or buried objects exist, at least to the depth of investigation.

16. Comparing the results of the different tests performed on the 1990 survey grid one area appears as anomalous. This area has been marked on each Figure of the results, and has coordinates (25N,40W), (90N,40W), (90N,150W), and (25N,150W). This area is both a magnetic and conductive high, the two together are very good indications that the area contains an item or items not natural to

the environment. This area therefore would have top priority for further investigations by trenching, excavation, or some other appropriate technique.

17. Comparing the results of the 1991 survey, a zone of both conductive and magnetic highs is apparent. A zone extending from the origin (station 0,0) in a nearly westward direction is quite obvious. The remaining portion of the grid is relatively 'quiet' and can be considered natural background for the purpose of this discussion. The previously mentioned zone however, is not natural and most likely indicative of disposal activity. From this rather broad zone two areas in particular appear to warrant further investigation. The first area is approximately 40 ft by 60 ft and centered around station (162.5N,87.5W), the second area is centered around station (12.5N,125W). There is an area of high conductivity centered around station (50N,100W) that exhibits very little to no magnetic susceptibility, this area is interpreted as not containing any metallic objects (of appreciable size). There are areas around the edges of the maps indicating conductive and magnetic highs, these are associated with the chain link fence and I-95 concrete supports.

PART V: CONCLUSIONS AND RECOMMENDATIONS

18. A geophysical investigation using magnetic and electromagnetic techniques was conducted at the PNSY in an effort to detect and delineate any anomalous areas that might be indicative of buried cylinders or trenching activity. Several areas at the surveyed site were interpreted as having anomalous readings and were noted. It is possible that the areas noted could be trenched areas where the cylinders reside, however this would need to be verified as mentioned in the interpretation discussion. The three areas specifically pointed out and discussed would each have equal priority for investigation to determine their cause.

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APPENDIX A

FIELD DATA FROM 1990 AND 1991 SURVEYS

PHILADELPHIA NAVAL SHIPYARD 1990 SURVEY
DATA AS COLLECTED IN THE FIELD

LINE: -60

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 80 Final Station: 260

Station	Cond. (mS/m)	Inphase [ppt]
80	43.8	
90	15	
100	63	
110	74.4	
120	67.20001	
130	81.60001	
140	110.4	
150	118.2	
160	114.6	
170	111	
180	102	
190	93.6	
200	91.8	
210	82.8	
220	73.8	
230	73.8	
240	76.8	
250	76.8	
260	78	

LINE: -50

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 260 Final Station: 80

Station	Cond. (mS/m)	Inphase [ppt]
260	34.8	
250	30.6	
240	79.8	
230	73.8	
220	84	
210	59.4	
200	63.6	
190	90	
180	91.8	
170	86.39999	
160	129	
150	152.4	
140	105.6	
130	64.2	
120	80.4	
110	69.6	
100	57	
90	70.8	
80	7.2	

LINE: -40

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 80 Final Station: 260

Station	Cond. (mS/m)	Inphase [ppt]
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80	31.8
90	48.6
100	74.4
110	75.6
120	93.6
130	91.8
140	142.2
150	143.4
160	110.4
170	87.6
180	54
190	48.6
200	86.39999
210	75.6
220	73.20001
230	76.8
240	67.8
250	22.8
260	76.20001

LINE: -30

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 260 Final Station: 90

Station	Cond. [mS/m]	Inphase [ppt]
260	85.20001	
250	46.2	
240	77.39999	
230	78.6	
220	113.4	
210	81.60001	
200	60	
190	69	
180	87	
170	84	
160	90	
150	106.2	
140	134.4	
130	152.4	
120	106.8	
110	131.4	
100	101.4	
90	62.4	

LINE: -20

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 80 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
80	40.8	
90	71.4	
100	-6	
110	104.4	
120	136.2	
130	158.4	
140	126.6	
150	83.4	

160	84.6
170	79.2
180	72
190	70.2
200	80.4
210	82.2
220	105.6
230	115.2
240	87.6
250	99.00001
260	104.4

LINE: -10

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 260 Final Station: 60

Station	Cond. [mS/m]	Inphase [ppt]
260	75	
250	65.4	
240	105	
230	123.6	
220	105	
210	99.00001	
200	87	
190	85.20001	
180	70.8	
170	74.4	
160	87.6	
150	109.8	
140	117.6	
130	113.4	
120	130.2	
110	96	
100	-508.8	
90	-538.8	
80	-240.6	
70	108	
60	64.8	

LINE: 0

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 40 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
40	45.6	117
50	40.2	114
60	57	180.6
70	142.8	150.6
80	117.6	131.4
90	-70.2	205.8
100	-161.4	170.4
110	180	484.2
120	190.2	374.4
130	130.2	217.8
140	118.8	246.6
150	110.4	201
160	107.4	91.2

170	69.6	118.8
180	75	128.4
190	81.60001	134.4
200	93	152.4
210	111.6	195.6
220	132	244.8
230	148.8	
240	133.8	
250	95.39999	140
260	108.6	100

LINE: 10

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 260 Final Station: 40

Station	Cond. [mS/m]	Inphase [ppt]
260	112.2	
250	124.2	
240	154.2	
230	186	
220	168.6	268.2
210	163.2	273.6
200	139.2	240.6
190	103.8	194.4
180	92.4	133.2
170	94.20001	142.2
160	78.6	151.2
150	110.4	172.2
140	121.8	208.8
130	146.4	291.6
120	182.4	452.4
110	205.2	306
100	162.6	324
90	145.8	346.8
80	175.8	214.2
70	220.8	199.2
60	213	220.2
50	174	225
40	24	40.8

LINE: 20

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 40 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
40	17.4	129.6
50	308.4	450
60	1004.4	226.2
70	217.2	318
80	123.6	344.4
90	194.4	384
100	169.2	280.8
110	145.2	378.6
120	226.2	472.8
130	234.6	396.6
140	174	255
150	136.8	227.4

160	119.4	223.2
170	112.8	190.2
180	114	181.2
190	118.8	222.6
200	132.6	270.6
210	145.2	280.8
220	157.2	274.8
230	189.6	
240	174.6	
250	147.6	155
260	115.8	115

LINE: 30

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 260 Final Station: 40

Station	Cond. [mS/m]	Inphase [ppt]
260	105.6	
250	115.2	
240	101.4	
230	111	
220	141.6	226.8
210	139.2	229.8
200	130.8	243
190	112.2	234.6
180	97.2	232.8
170	107.4	298.2
160	120	336
150	129	300
140	173.4	315
130	201.6	475.2
120	219.6	396
110	139.2	426.6
100	167.4	480.6
90	168	424.8
80	120	378
70	184.8	392.4
60	54	435
50	168	445.2
40	210.6	288.6

LINE: 40

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 10 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
10	43.8	
20	61.8	133.2
30	136.2	246.6
40	177	419.4
50	181.8	397.8
60	198.6	468
70	189	457.2
80	165.6	327
90	150	378
100	144.6	384.6
110	138.6	333.6

120	128.4	324.6
130	128.4	346.8
140	126.6	315
150	127.8	334.2
160	123	316.8
170	121.8	272.4
180	106.8	244.2
190	104.4	222.6
200	100.2	186
210	93	163.8
220	99.00001	157.2
230	94.8	
240	97.8	
250	96	90
260	80.4	100

LINE: 50

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 260 Final Station: 20

Station	Cond. [mS/m]	Inphase [ppt]
260	42	
250	66.6	
240	67.20001	
230	73.20001	
220	69.6	116.4
210	103.8	152.4
200	98.4	153.6
190	100.2	195.6
180	104.4	231
170	115.8	239.4
160	116.4	238.2
150	101.4	257.4
140	109.2	216.6
130	109.2	217.8
120	74.4	210
110	79.2	306
100	116.4	319.2
90	159.6	396
80	196.2	437.4
70	217.8	518.4
60	196.8	413.4
50	148.8	460.2
40	213.6	645
30	138.6	285.6
20	47.4	94.20001

LINE: 60

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 0 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
0	18	65.4
10	23.4	99.6
20	74.4	231
30	114.6	241.8
40	134.4	462.6

50	166.2	319.2
60	141.6	335.4
70	143.4	445.8
80	177	385.8
90	165.6	318
100	109.2	264.6
110	80.4	218.4
120	78.6	202.8
130	100.2	181.2
140	97.8	157.8
150	96.6	186
160	99.00001	169.8
170	92.4	180.6
180	95.39999	175.8
190	94.20001	151.8
200	72	139.8
210	75.6	131.4
220	80.4	108
230	79.8	
240	84	
250	73.20001	85
260	70.8	45

LINE: 70

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 260 Final Station: 0

Station	Cond. [mS/m]	Inphase [ppt]
260	68.4	
250	64.2	
240	62.4	
230	79.8	
220	64.8	84
210	68.4	107.4
200	65.4	101.4
190	78	130.8
180	71.4	157.8
170	84	165.6
160	87	156
150	79.8	142.2
140	77.39999	162
130	105.6	177.6
120	135	188.4
110	83.4	205.8
100	79.8	289.8
90	125.4	289.8
80	142.2	316.8
70	167.4	316.2
60	112.2	285.6
50	148.2	527.4
40	144	262.8
30	75.6	204.6
20	78	241.2
10	66	147.6
0	60	91.2

LINE: 80

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 0 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
0	64.2	112.2
10	60.6	115.2
20	55.2	213.6
30	68.4	211.2
40	78	310.8
50	126.6	343.2
60	150	337.8
70	103.8	226.8
80	123.6	271.2
90	142.8	258
100	124.2	220.2
110	87.6	255
120	103.8	174.6
130	116.4	127.2
140	98.4	150
150	52.2	134.4
160	59.4	145.8
170	70.8	148.8
180	67.8	148.8
190	70.8	138
200	76.20001	102
210	78.6	100.8
220	75	109.8
230	68.4	
240	66	
250	65.4	70
260	50.4	40

LINE: 90

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 260 Final Station: 0

Station	Cond. [mS/m]	Inphase [ppt]
260	63.6	
250	56.4	
240	60	
230	63	
220	56.4	84
210	65.4	85.8
200	63.6	109.8
190	70.8	117.6
180	75	126
170	66	123.6
160	85.8	138
150	88.8	121.8
140	80.4	112.8
130	100.2	138.6
120	83.4	163.2
110	66.6	211.8
100	102.6	284.4
90	124.2	288

80	115.2	260.4
70	114	200.4
60	156	456
50	177	440.4
40	162	435.6
30	97.2	133.2
20	60.6	173.4
10	53.4	118.2
0	47.4	115.2

LINE: 100

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 0 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
0	38.4	100.2
10	45	130.8
20	57.6	141
30	75.6	292.8
40	130.2	440.4
50	177	400.2
60	170.4	353.4
70	134.4	286.2
80	93	166.2
90	108	295.8
100	144	307.8
110	121.2	260.4
120	63	129
130	63	148.8
140	109.2	128.4
150	111.6	105
160	99.6	127.2
170	81	136.2
180	83.4	127.8
190	88.2	138.6
200	76.8	121.8
210	89.4	109.8
220	103.8	49.2
230	37.8	
240	59.4	
250	55.6	62
260	61.2	50

LINE: 110

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 260 Final Station: 0

Station	Cond. [mS/m]	Inphase [ppt]
260	61.2	
250	55.2	
240	61.2	
230	55.2	
220	59.4	77.39999
210	80.4	101.4
200	68.4	123.6
190	57.6	123.6
180	106.8	131.4

170	117	153.6
160	94.8	118.2
150	60.6	142.8
140	44.4	141.6
130	60.6	207
120	78.6	154.8
110	88.8	273.6
100	135	324.6
90	138.6	211.2
80	129	305.4
70	147.6	311.4
60	133.8	300
50	140.4	366.6
40	114	338.4
30	150.6	300.6
20	112.2	114.6
10	72	103.8
0	63	77.39999

LINE: 120

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 0 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
0	49.2	130.2
10	64.2	110.4
20	83.4	234.6
30	84.6	294.6
40	66.6	297.6
50	133.8	285.6
60	145.2	290.4
70	132	325.8
80	136.8	359.4
90	124.2	254.4
100	135	319.8
110	129	244.2
120	57.6	189
130	64.8	167.4
140	64.8	121.8
150	54.6	118.2
160	57	128.4
170	70.2	116.4
180	72.6	130.8
190	81.60001	118.8
200	79.2	120
210	78.6	75
220	87	87
230	45	
240	54.6	
250	54.6	40
260	70.8	59

LINE: 130

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 260 Final Station: 0

Station	Cond. [mS/m]	Inphase [ppt]
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260	53.4	
250	42.6	
240	43.8	
230	58.2	
220	45	62.4
210	66	70.2
200	91.8	74.4
190	58.8	103.8
180	61.2	106.8
170	43.8	66
160	60	115.2
150	49.2	109.8
140	53.4	105
130	65.4	139.8
120	68.4	146.4
110	89.4	259.8
100	120.6	303.6
90	156	348.6
80	163.2	371.4
70	171	341.4
60	159	318.6
50	110.4	239.4
40	113.4	262.2
30	109.2	276.6
20	84.6	279.6
10	99.00001	123.6
0	70.8	117.6

LINE: 140

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 0 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
0	39	172.2
10	79.2	250.2
20	136.2	265.8
30	137.4	278.4
40	128.4	286.8
50	129	282
60	120.6	283.8
70	117.6	292.8
80	135.6	355.8
90	157.8	338.4
100	144.6	280.8
110	106.8	192.6
120	73.20001	135.6
130	62.4	127.2
140	45	88.8
150	40.2	87.6
160	49.8	86.3
170	60.6	86.3
180	60.6	76.2
190	73.8	84.6
200	84.6	78
210	78	61.2

220	50.4	51.6
230	18	
240	28.2	
250	49.2	40
260	45	10

LINE: 150

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 260 Final Station: 0

Station	Cond. [mS/m]	Inphase [ppt]
260	52.8	
250	33	
240	52.2	
230	47.4	
220	9.6	55.2
210	22.2	46.8
200	24.6	48
190	68.4	58.8
180	73.8	60
170	60	71.4
160	57.6	79.2
150	45	64.2
140	46.2	69.6
130	47.4	78
120	53.4	92.4
110	53.4	106.8
100	64.2	268.8
90	114.6	273.6
80	89.4	248.4
70	13.2	241.2
60	75	218.4
50	67.8	187.8
40	69.6	187.2
30	69	189.6
20	58.8	166.2
10	82.8	177.6
0	75	157.2

LINE: 160

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 0 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
0	86.39999	154.8
10	100.2	168
20	75	193.8
30	73.8	211.2
40	63.6	126.6
50	-41.4	120
60	3	178.2
70	81.60001	182.4
80	76.8	184.2
90	73.8	172.2
100	70.8	115.8
110	63.6	105.6
120	48.6	82.2

130	47.4	87.6
140	49.8	71.4
150	54	66
160	48	73.8
170	43.8	50.4
180	46.2	58.2
190	56.4	61.8
200	84	43.8
210	59.4	39.6
220	55.2	53.4
230	40.2	
240	59.4	
250	51	50
260	46.2	70

LINE: 170

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 260 Final Station: 0

Station	Cond. [mS/m]	Inphase [ppt]
260	18	
250	-4.2	
240	41.4	
230	46.2	
220	52.8	55.2
210	45	48.6
200	60	37.2
190	44.4	36.6
180	36	49.2
170	48	47.4
160	40.2	55.2
150	32.4	57.6
140	32.4	61.8
130	50.4	70.2
120	55.8	102.6
110	45	16.8
100	22.8	109.2
90	54.6	69
80	63	79.8
70	35.4	127.2
60	31.2	130.2
50	28.2	108.6
40	-27	82.8
30	-11.4	98.4
20	37.2	141
10	57.6	141
0	70.2	130.8

LINE: 180

Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start Station: 0 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
0	27	143.4
10	35.4	123
20	45	118.2
30	9.6	93.6

40	-28.8	47.4
50	-31.8	84.6
60	26.4	104.4
70	18	100.8
80	24	74.4
90	77.39999	72.6
100	57	103.8
110	37.2	10.2
120	54	122.4
130	52.2	84.6
140	45.6	69
150	34.8	69.6
160	41.4	67.2
170	36.6	51
180	43.8	49.8
190	22.8	69.6
200	31.2	48
210	53.4	36
220	28.2	30.6
230	52.8	
240	47.4	
250	50.4	45
260	48	40

LINE: 190

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 260 Final Station: 0

Station	Cond. (mS/m)	Inphase [ppt]
260	78.6	
250	85.20001	
240	70.2	
230	102.6	
220	101.4	22.8
210	61.8	28.8
200	152.4	58.8
190	106.8	79.8
180	104.4	100.8
170	181.8	139.8
160	262.2	136.8
150	186.6	136.2
140	140.4	138.6
130	99.6	154.8
120	116.4	191.4
110	110.4	161.4
100	96.6	160.2
90	105	147.6
80	126	126.6
70	132	140.4
60	170.4	171.6
50	336	153.6
40	259.2	111.6
30	142.8	136.8
20	119.4	145.8
10	104.4	144.6

0 161.4 144.6

LINE: 200

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 260 Final Station: 60

Station	Cond. [mS/m]	Inphase [ppt]
260	262.2	150
250	432.6	200
240	440.4	
230	592.8	
220	74.4	18.6
210	-8.400001	28.2
200	217.8	68.4
190	472.8	94.2
180	423.6	154.2
170	313.2	169.8
160	286.8	140.4
150	354	158.4
140	224.4	186.6
130	286.8	170.4
120	345	217.2
110	240	247.8
100	414	179.4
90	300.6	212.4
80	396	266.4
70	424.2	309.6
60	369.6	249

LINE: 210

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 60 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
60	7.8	70.8
70	28.8	72.6
80	27	70.2
90	25.8	75
100	35.4	88.2
110	36.6	66.6
120	30.6	72
130	29.4	70.2
140	37.8	76.8
150	49.2	76.2
160	39.6	60
170	37.2	49.2
180	32.4	42.6
190	28.8	34.8
200	50.4	27.6
210	37.8	35.4
220	35.4	28.8
230	56.4	
240	51.6	
250	59.4	
260	40.8	

LINE: 220

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 260 Final Station: 60

Station	Cond. [mS/m]	Inphase [ppt]
260	163.2	170
250	121.8	110
240	71.4	
230	64.2	
220	44.4	9.6
210	22.2	26.4
200	33.6	27.6
190	54	37.8
180	35.4	30.6
170	13.8	30
160	23.4	45.6
150	30.6	44.4
140	39	46.8
130	36.6	49.2
120	24.6	54
110	33	52.8
100	35.4	52.8
90	-30.6	52.8
80	-31.8	58.8
70	31.8	69.6
60	22.8	60.6

LINE: 230

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 60 Final Station: 260

Station	Cond. [mS/m]	Inphase [ppt]
60	37.8	69
70	24	62.4
80	13.2	64.2
90	31.8	63.6
100	33.6	60
110	28.8	44.4
120	37.8	49.2
130	43.2	55.8
140	42.6	54
150	35.4	45
160	48	48
170	48	35.4
180	40.2	34.2
190	64.2	37.2
200	53.4	24
210	33	21.6
220	63	25.8
230	83.4	
240	124.8	
250	489.6	
260	593.4	

LINE: 240

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start Station: 240 Final Station: 60

Station	Cond. [mS/m]	Inphase [ppt]
240	498.6	310

230	235.8	
220	115.2	16.8
210	146.4	12
200	221.4	17.4
190	317.4	33.6
180	265.2	36.6
170	84.6	31.2
160	40.2	33
150	42.6	42.6
140	40.2	42.6
130	38.4	51.6
120	31.2	32.4
110	27	38.4
100	39.6	50.4
90	39.6	63
80	37.8	60.6
70	-9.6	51.6
60	-59.4	50.4

EDA OMNI-IV Tie-line MAG Ser #255059

TOTAL FIELD DATA (uncorrected)

Date: 12 JUL 90

Operator: 3000

Reference field: 53246.0

Datum subtracted: 0.0

Records: 490

Bat: 17.2 Volt Lithium: 3.50 Volt

Last time update: 4/20 10:21:00

Start of print: 7/12 18:01:11

Ref. Fld 53041.1 .09 0.0 9:52:13 88

Line: 1 Date: 12 JUL 90 #2

POSITION	FIELD	ERR	DRIFT	TIME	DS
50	53343.8	.18	0.0	9:54:18	78
60	54099.1	.72	0.0	9:54:34	58
70	53492.9	.10	0.0	9:54:46	88
80	52091.0	.23	0.0	9:54:56	78
90	51738.5	2.5	0.0	9:55:06	68
100	52105.6	.04	0.0	9:55:22	88
110	52387.1	.11	0.0	9:55:32	88
120	53007.0	.26	0.0	9:55:47	78
130	54418.2	1.1	0.0	9:55:57	48
140	53137.3	18.	0.0	9:56:07	47
150	54615.3	5.0	0.0	9:56:16	58
160	53203.9	.12	0.0	9:56:25	88
170	54614.0	.22	0.0	9:56:35	88
180	53552.5	.23	0.0	9:56:45	88
190	53846.7	.12	0.0	9:56:55	88
200	55183.7	1.8	0.0	9:57:05	48
210	55003.7	3.9	0.0	9:57:15	78
220	53761.0	7.1	0.0	9:57:23	36
230	48959.6	30.	0.0	9:57:32	34

Line: 2 Date: 12 JUL 90 #21

POSITION	FIELD	ERR	DRIFT	TIME	DS
210	51994.2	23.	0.0	9:57:46	44
200	48917.1	16.	0.0	9:58:40	42
190	49483.0	3.3	0.0	9:58:53	56
180	53581.5	48.	0.0	9:59:03	36
170	55214.7	4.7	0.0	9:59:13	68
160	56373.6	1.4	0.0	9:59:23	78
150	60488.9	50.	0.0	9:59:32	31
140	49334.4	54.	0.0	9:59:42	23
130	53318.8	4.5	0.0	9:59:51	68
120	54973.1	2.8	0.0	10:00:01	88
110	53985.2	.14	0.0	10:00:09	88
100	52497.5	.09	0.0	10:00:19	88
90	51406.1	.46	0.0	10:00:29	68
80	51141.9	1.1	0.0	10:00:45	48
70	51604.2	.97	0.0	10:00:55	88
60	52878.8	.07	0.0	10:01:05	88
50	54062.7	.92	0.0	10:01:14	88
40	53345.4	.12	0.0	10:01:24	88
30	55895.8	44.	0.0	10:01:35	35

Line: 3 Date: 12 JUL 90 #40

POSITION	FIELD	ERR	DRIFT	TIME	DS
50	56676.0	4.5	0.0	10:01:50	56
60	49680.2	13.	0.0	10:02:42	32
70	49456.7	3.4	0.0	10:02:51	56
80	53657.6	10.	0.0	10:03:00	47
90	53594.9	.35	0.0	10:03:08	88
100	53024.5	.63	0.0	10:03:21	58
110	50813.4	5.1	0.0	10:03:31	68
120	51821.6	.12	0.0	10:03:40	88
130	53527.1	4.1	0.0	10:03:50	88
140	54960.3	1.9	0.0	10:04:00	38
150	54564.7	1.8	0.0	10:04:09	68
160	53037.7	.26	0.0	10:04:19	78
170	53768.3	4.1	0.0	10:04:29	58
180	52464.3	7.7	0.0	10:04:38	67
190	51410.1	4.3	0.0	10:04:50	55
200	48700.0	2.2	0.0	10:05:00	33
210	50537.9	.53	0.0	10:05:12	58
220	53773.9	17.	0.0	10:05:27	48
230	56039.9	5.4	0.0	10:05:39	88

Line: 4 Date: 12 JUL 90 #59

POSITION	FIELD	ERR	DRIFT	TIME	DS
210	54442.8	.08	0.0	10:05:54	88
200	54735.0	.30	0.0	10:06:41	68
190	51663.3	42.	0.0	10:06:56	35
180	52435.6	11.	0.0	10:07:06	47
170	57840.0	4.0	0.0	10:07:17	34
160	51781.3	9.0	0.0	10:07:28	33
150	50493.5	5.5	0.0	10:07:40	31
140	54514.6	18.	0.0	10:07:50	43
130	50216.5	28.	0.0	10:08:02	32
120	51715.6	.25	0.0	10:08:17	78
110	48635.3	32.	0.0	10:08:34	42
100	44584.0	34.	0.0	10:08:44	31
90	47783.7	3.8	0.0	10:08:54	36
80	53336.9	37.	0.0	10:09:04	35
70	55569.1	1.4	0.0	10:09:14	48
60	55678.2	5.5	0.0	10:09:25	56
50	50762.4	9.3	0.0	10:09:44	64
40	52485.5	.87	0.0	10:09:53	68
30	55103.1	.13	0.0	10:10:04	88

Ref. Fld 53011.8 .09 0.0 10:10:31 88

Line: 5 Date: 12 JUL 90 #79

POSITION	FIELD	ERR	DRIFT	TIME	DS
30	53423.1	.06	0.0	10:10:49	88
40	55201.5	2.4	0.0	10:11:24	48
50	60787.4	76.	0.0	10:11:33	22
60	54627.8	1.0	0.0	10:11:43	45
70	53488.6	.10	0.0	10:11:52	88
80	54013.3	.51	0.0	10:12:01	68
90	53530.0	.17	0.0	10:12:12	88
100	51306.4	.36	0.0	10:12:22	78

110	47758.4	55.	0.0	10:12:33	35
120	45853.2	34.	0.0	10:12:43	34
130	48792.9	.91	0.0	10:12:53	48
140	53811.2	14.	0.0	10:13:05	52
150	52687.6	3.5	0.0	10:13:13	78
160	55794.0	1.9	0.0	10:13:23	68
170	59807.9	4.1	0.0	10:13:33	36
180	53273.8	26.	0.0	10:13:41	34
190	50507.5	11.	0.0	10:13:48	42
200	53151.0	11.	0.0	10:13:57	48
210	53562.5	9.7	0.0	10:14:05	38
220	54918.0	.13	0.0	10:14:13	88
230	53926.1	.23	0.0	10:14:22	78

Line: 6 Date: 12 JUL 90 #100

POSITION	FIELD	ERR	DRIFT	TIME	DS
210	54521.9	.06	0.0	10:14:35	88
200	55914.7	.54	0.0	10:15:16	58
190	54969.3	1.7	0.0	10:15:27	38
180	49656.8	26.	0.0	10:15:37	42
170	48329.4	9.3	0.0	10:15:46	54
160	51829.6	30.	0.0	10:16:05	47
150	55352.3	17.	0.0	10:16:17	47
140	55462.9	55.	0.0	10:16:30	37
130	51088.6	11.	0.0	10:16:43	54
120	49842.0	3.5	0.0	10:16:55	42
110	50401.4	3.5	0.0	10:17:07	38
100	50034.4	3.5	0.0	10:17:19	58
90	50313.1	.42	0.0	10:17:29	78
80	50402.9	3.1	0.0	10:17:42	58
70	54745.8	27.	0.0	10:17:52	43
60	58045.2	1.8	0.0	10:18:02	34
50	54354.6	.82	0.0	10:18:11	46
40	58119.5	7.2	0.0	10:18:22	34
30	59550.7	10.	0.0	10:18:32	44
20	55550.3	.58	0.0	10:18:41	56
10	53404.6	.14	0.0	10:18:53	88

Line: 7 Date: 12 JUL 90 #121

POSITION	FIELD	ERR	DRIFT	TIME	DS
10	53031.1	.07	0.0	10:19:09	88
20	53303.8	.08	0.0	10:19:37	88
30	52631.1	1.2	0.0	10:19:46	68
40	53872.0	.33	0.0	10:19:55	68
50	55497.5	5.0	0.0	10:20:04	38
60	48991.3	61.	0.0	10:20:14	32
70	43266.0	46.	0.0	10:21:03	21
80	52512.2	1.8	0.0	10:21:17	44
90	54788.7	9.9	0.0	10:21:27	38
100	50653.5	8.7	0.0	10:21:39	35
110	52658.9	1.1	0.0	10:21:52	88
120	52206.4	.08	0.0	10:24:13	88
130	55088.9	2.6	0.0	10:24:23	43
140	54825.3	5.4	0.0	10:24:34	55
150	51442.6	5.7	0.0	10:24:43	76

160	54437.0	1.2	0.0	10:24:52	58
170	52919.9	6.8	0.0	10:25:00	48
180	49101.4	13.	0.0	10:25:09	54
190	51495.9	6.7	0.0	10:25:18	48
200	50522.9	3.8	0.0	10:25:28	54
210	50235.5	13.	0.0	10:25:36	42
220	56258.7	16.	0.0	10:25:45	53
230	55099.9	.06	0.0	10:25:54	88
Line: 8 Date: 12 JUL 90 #144					
POSITION	FIELD	ERR	DRIFT	TIME	DS
210	55752.5	.34	0.0	10:26:11	68
200	55268.1	11.	0.0	10:26:54	38
190	50195.0	25.	0.0	10:27:05	43
180	54478.2	61.	0.0	10:27:14	34
170	52253.0	8.3	0.0	10:27:22	53
160	53777.1	14.	0.0	10:27:32	44
150	48247.6	30.	0.0	10:27:40	33
140	52126.3	6.7	0.0	10:27:48	58
130	52649.9	.11	0.0	10:27:59	88
120	53148.4	.59	0.0	10:28:10	58
110	52151.8	63.	0.0	10:28:20	35
100	53318.6	.11	0.0	10:28:29	88
90	53356.5	.06	0.0	10:28:38	88
80	53201.0	.15	0.0	10:28:48	88
70	50863.4	.19	0.0	10:29:06	88
60	51013.8	17.	0.0	10:29:18	42
50	52498.7	1.7	0.0	10:29:29	48
40	54754.6	3.8	0.0	10:29:39	38
30	53876.4	.10	0.0	10:29:49	88
20	53547.7	.21	0.0	10:30:02	88
10	52344.2	.80	0.0	10:30:12	68
0	52872.5	.06	0.0	10:30:21	88
Ref. Fld	53021.1	.07	0.0	10:30:38	88
Line: 9 Date: 12 JUL 90 #167					
POSITION	FIELD	ERR	DRIFT	TIME	DS
10	52023.8	9.5	0.0	10:30:57	58
20	52780.7	.07	0.0	10:31:20	88
30	54048.3	.42	0.0	10:31:30	68
40	53015.1	3.2	0.0	10:31:39	68
50	52710.9	.08	0.0	10:31:49	88
60	52628.4	.08	0.0	10:31:59	88
70	50762.4	12.	0.0	10:32:08	47
80	52909.2	16.	0.0	10:32:17	48
90	54666.6	.54	0.0	10:32:25	58
100	53947.8	.07	0.0	10:32:34	88
110	53892.7	.06	0.0	10:32:43	88
120	55405.6	.73	0.0	10:32:51	48
130	55750.3	1.2	0.0	10:32:59	78
140	52605.6	13.	0.0	10:33:07	46
150	52467.5	1.1	0.0	10:33:14	48
160	52967.7	5.4	0.0	10:33:22	38
170	47892.6	27.	0.0	10:33:43	33
180	55815.9	23.	0.0	10:33:55	42

190	58494.0	2.4	0.0	10:34:03	43
200	54780.6	.70	0.0	10:34:11	47
210	58644.0	72.	0.0	10:34:20	31
220	53384.6	.37	0.0	10:34:28	66
230	56202.9	7.8	0.0	10:34:38	67
Line: 10 Date: 12 JUL 90 #190					
POSITION	FIELD	ERR	DRIFT	TIME	DS
210	55258.6	5.8	0.0	10:34:53	36
200	51151.8	9.5	0.0	10:35:18	47
190	50524.3	21.	0.0	10:35:27	37
180	60481.4	61.	0.0	10:35:35	34
170	59028.3	6.2	0.0	10:35:44	35
160	51280.8	27.	0.0	10:36:01	22
150	50962.2	8.8	0.0	10:36:09	55
140	53626.8	8.8	0.0	10:36:18	58
130	56207.9	6.3	0.0	10:36:27	43
120	51859.9	52.	0.0	10:36:44	31
110	54617.7	13.	0.0	10:36:54	55
100	55673.2	2.4	0.0	10:37:02	48
90	54321.0	.15	0.0	10:37:11	78
80	54737.5	.05	0.0	10:37:20	88
70	55595.4	2.6	0.0	10:37:30	68
60	58654.5	73.	0.0	10:37:42	22
50	52868.1	4.4	0.0	10:37:51	55
40	53214.3	.06	0.0	10:38:01	88
30	53065.8	.25	0.0	10:38:10	78
20	51170.8	51.	0.0	10:38:18	36
10	53317.2	.31	0.0	10:38:27	78
0	53182.8	.06	0.0	10:38:37	88
-10	52844.0	.09	0.0	10:38:46	88
Line: 11 Date: 12 JUL 90 #213					
POSITION	FIELD	ERR	DRIFT	TIME	DS
10	52139.9	.29	0.0	10:39:00	88
20	52471.4	.12	0.0	10:39:32	88
30	51098.1	2.5	0.0	10:39:41	38
40	52297.1	.06	0.0	10:39:49	88
50	52877.4	.07	0.0	10:39:58	88
60	53963.1	.12	0.0	10:40:06	88
70	55821.3	8.9	0.0	10:40:16	55
80	52558.4	31.	0.0	10:40:24	34
90	55348.5	.36	0.0	10:40:35	88
100	56009.7	.07	0.0	10:40:46	88
110	55814.9	.12	0.0	10:40:55	88
120	55506.0	11.	0.0	10:41:04	48
130	51113.6	24.	0.0	10:41:14	42
140	52188.2	5.1	0.0	10:41:22	38
150	57836.2	62.	0.0	10:41:31	33
160	57220.0	3.7	0.0	10:41:39	37
170	54811.1	1.5	0.0	10:41:47	47
180	53777.2	3.2	0.0	10:41:55	38
190	50365.8	6.2	0.0	10:42:04	42
200	55099.1	13.	0.0	10:42:12	54
210	51583.0	4.8	0.0	10:42:20	35

220	50420.6	1.1	0.0	10:42:29	58
230	48999.0	17.	0.0	10:42:38	45
Line: 12 Date: 12 JUL 90 #236					
POSITION	FIELD	ERR	DRIFT	TIME	DS
210	55165.5	14.	0.0	10:42:51	43
200	50603.8	24.	0.0	10:43:11	35
190	50415.7	.40	0.0	10:43:19	68
180	49234.8	15.	0.0	10:43:29	46
170	52752.4	9.8	0.0	10:43:38	46
160	56387.6	6.1	0.0	10:43:48	35
150	54218.3	.72	0.0	10:43:56	48
140	55813.8	.40	0.0	10:44:05	68
130	55850.3	.06	0.0	10:44:14	88
120	52842.6	27.	0.0	10:44:24	34
110	53538.5	1.5	0.0	10:44:33	48
100	55581.6	2.0	0.0	10:44:42	68
90	56954.9	11.	0.0	10:44:51	48
80	59207.5	1.3	0.0	10:44:59	48
70	59796.8	5.9	0.0	10:45:07	45
60	56596.0	.67	0.0	10:45:17	46
50	54716.7	.17	0.0	10:45:24	78
40	53560.3	.09	0.0	10:45:34	88
30	53171.2	.09	0.0	10:45:43	88
20	52582.3	.10	0.0	10:45:53	88
10	52258.5	.14	0.0	10:46:03	88
0	51796.3	.77	0.0	10:46:17	58
-10	52283.9	.08	0.0	10:46:29	88
Ref. Fld	53041.7	.07	0.0	10:46:54	88
Line: 13 Date: 12 JUL 90 #260					
POSITION	FIELD	ERR	DRIFT	TIME	DS
10	53419.1	.08	0.0	10:47:19	88
20	53890.7	.36	0.0	10:47:55	78
30	53928.0	.16	0.0	10:48:03	78
40	53290.6	.13	0.0	10:48:12	88
50	53522.3	.07	0.0	10:48:21	88
60	54585.2	.12	0.0	10:48:29	88
70	55020.4	.07	0.0	10:48:37	88
80	56913.2	3.5	0.0	10:48:45	78
90	62012.6	17.	0.0	10:48:54	42
100	61703.2	34.	0.0	10:49:04	35
110	54814.8	4.4	0.0	10:49:13	33
120	54314.6	.52	0.0	10:49:21	48
130	53852.8	2.4	0.0	10:49:28	48
140	53282.4	4.0	0.0	10:49:36	38
150	55924.2	1.0	0.0	10:49:45	48
160	51617.1	12.	0.0	10:49:54	42
170	52098.9	2.3	0.0	10:50:02	57
180	57917.7	57.	0.0	10:50:11	22
190	56022.6	17.	0.0	10:50:18	38
200	54363.7	4.8	0.0	10:50:25	35
210	51466.0	21.	0.0	10:50:33	44
220	49404.8	21.	0.0	10:50:42	46
230	51864.3	1.3	0.0	10:50:50	48

Line: 14 Date: 12 JUL 90 #283

POSITION	FIELD	ERR	DRIFT	TIME	DS
210	49445.1	3.6	0.0	10:51:03	42
200	50191.1	3.0	0.0	10:51:29	38
190	53395.5	16.	0.0	10:51:37	51
180	51767.4	3.2	0.0	10:51:47	42
170	55590.4	5.9	0.0	10:51:56	76
160	57599.3	2.2	0.0	10:52:08	54
150	52577.6	4.0	0.0	10:52:18	43
140	54313.3	.95	0.0	10:52:27	58
130	52910.0	8.1	0.0	10:52:35	55
120	54271.2	.46	0.0	10:52:46	68
110	52530.4	.74	0.0	10:52:55	58
100	54892.6	32.	0.0	10:53:05	37
90	55128.9	.07	0.0	10:53:13	88
80	55653.9	2.4	0.0	10:53:22	58
70	57387.8	5.3	0.0	10:53:32	58
60	56084.1	.39	0.0	10:53:41	58
50	55323.6	.09	0.0	10:53:51	88
40	55026.6	1.5	0.0	10:54:01	68
30	54725.2	.34	0.0	10:54:09	68
20	54835.1	.80	0.0	10:54:18	58
10	54334.1	.07	0.0	10:54:26	88
0	53663.2	.07	0.0	10:54:36	88
-10	53674.0	.07	0.0	10:54:46	88

Line: 15 Date: 12 JUL 90 #306

POSITION	FIELD	ERR	DRIFT	TIME	DS
10	53821.0	.06	0.0	10:55:01	88
20	53275.2	.66	0.0	10:55:34	58
30	54797.9	.51	0.0	10:55:49	58
40	53422.6	5.5	0.0	10:55:59	37
50	52253.3	1.3	0.0	10:56:10	48
60	53567.7	.14	0.0	10:56:20	88
70	53433.4	.49	0.0	10:56:28	58
80	54172.3	.08	0.0	10:56:40	88
90	53827.5	.14	0.0	10:56:49	88
100	54422.9	.06	0.0	10:56:59	88
110	54460.3	.11	0.0	10:57:08	88
120	54932.3	.63	0.0	10:57:20	48
130	53590.1	1.3	0.0	10:57:30	58
140	52804.8	2.0	0.0	10:57:40	38
150	53179.9	5.6	0.0	10:57:49	48
160	59017.9	72.	0.0	10:57:58	23
170	53620.4	57.	0.0	10:58:07	33
180	56214.8	.45	0.0	10:58:17	68
190	55314.1	.11	0.0	10:58:26	88
200	51097.6	9.6	0.0	10:58:36	42
210	55295.0	11.	0.0	10:58:45	42
220	52481.6	13.	0.0	10:58:56	47
230	49321.2	18.	0.0	10:59:05	42

Line: 16 Date: 12 JUL 90 #329

POSITION	FIELD	ERR	DRIFT	TIME	DS
210	54414.5	61.	0.0	10:59:18	22

200	51695.7	11.	0.0	10:59:38	56
190	53516.6	15.	0.0	10:59:47	25
180	53886.0	18.	0.0	10:59:56	48
170	57013.4	3.8	0.0	11:00:04	76
160	56171.2	.26	0.0	11:00:14	68
150	55730.5	11.	0.0	11:00:24	37
140	54024.7	.53	0.0	11:00:34	58
130	53518.9	7.3	0.0	11:00:47	48
120	54720.0	10.	0.0	11:00:57	38
110	51511.7	27.	0.0	11:01:06	23
100	55719.9	11.	0.0	11:01:15	55
90	55142.9	.08	0.0	11:01:25	88
80	55378.5	1.2	0.0	11:01:36	38
70	53189.1	.32	0.0	11:01:45	68
60	49678.9	17.	0.0	11:01:56	43
50	49363.8	3.0	0.0	11:02:06	55
40	53177.0	1.2	0.0	11:02:15	47
30	54092.0	4.4	0.0	11:02:25	68
20	49115.8	34.	0.0	11:02:35	33
10	51539.6	11.	0.0	11:02:45	36
0	53930.6	.14	0.0	11:02:56	88
-10	55098.0	.77	0.0	11:03:07	88
Line: 17 Date: 12 JUL 90 #352					
POSITION	FIELD	ERR	DRIFT	TIME	DS
10	54063.7	.20	0.0	11:03:20	78
20	55059.6	1.4	0.0	11:03:45	88
30	51479.8	10.	0.0	11:03:54	54
40	54135.7	.41	0.0	11:04:04	68
50	54956.1	.72	0.0	11:04:13	58
60	52902.3	.40	0.0	11:04:22	68
70	50381.0	34.	0.0	11:04:30	35
80	50253.5	1.6	0.0	11:04:40	48
90	50598.2	4.3	0.0	11:04:48	38
100	54373.1	1.8	0.0	11:05:00	66
110	55586.3	1.2	0.0	11:05:09	78
120	53408.0	2.1	0.0	11:05:20	47
130	51548.1	17.	0.0	11:05:28	47
140	53179.6	1.8	0.0	11:05:38	58
150	54477.5	3.3	0.0	11:05:48	58
160	50666.1	6.0	0.0	11:05:57	54
170	53658.3	3.4	0.0	11:06:05	58
180	56044.3	1.4	0.0	11:06:13	48
190	56138.1	.77	0.0	11:06:22	48
200	53424.6	45.	0.0	11:06:31	35
210	48968.5	52.	0.0	11:06:39	33
220	51415.0	13.	0.0	11:06:47	58
230	54451.1	13.	0.0	11:06:56	55
Line: 18 Date: 12 JUL 90 #375					
POSITION	FIELD	ERR	DRIFT	TIME	DS
210	53141.9	1.2	0.0	11:07:08	47
200	51395.2	7.7	0.0	11:07:27	36
190	55349.8	16.	0.0	11:07:39	42
180	53743.7	7.3	0.0	11:07:49	37

170	52508.4	9.5	0.0	11:07:58	53
160	50207.6	38.	0.0	11:08:07	33
150	49769.7	4.7	0.0	11:08:16	42
140	49622.6	3.4	0.0	11:08:25	42
130	51794.3	6.4	0.0	11:08:34	48
120	53075.3	.81	0.0	11:08:42	68
110	53480.7	.17	0.0	11:08:51	78
100	51885.7	1.4	0.0	11:09:00	48
90	50582.4	2.1	0.0	11:09:08	66
80	49031.1	18.	0.0	11:09:18	43
70	51205.3	.41	0.0	11:09:27	68
60	51246.8	.10	0.0	11:09:39	88
50	51373.3	.54	0.0	11:09:49	58
40	54428.1	.37	0.0	11:09:58	68
30	55994.0	1.9	0.0	11:10:07	78
20	53515.6	6.3	0.0	11:10:19	36
10	50949.3	18.	0.0	11:10:30	34
0	55620.0	4.0	0.0	11:10:39	35
-10	54790.9	.12	0.0	11:10:50	88
Ref. Fld	53023.2	.10	0.0	11:11:38	88

Line: 19 Date: 12 JUL 90 #399

POSITION	FIELD	ERR	DRIFT	TIME	DS
10	55874.9	1.7	0.0	11:12:19	67
20	53935.1	.43	0.0	11:12:44	78
30	51936.5	.40	0.0	11:12:54	58
40	50457.0	25.	0.0	11:13:04	42
50	54941.6	16.	0.0	11:13:11	53
60	54062.6	4.5	0.0	11:13:20	58
70	51628.8	.34	0.0	11:14:52	78
80	49568.9	48.	0.0	11:15:05	34
90	49131.5	55.	0.0	11:15:17	32
100	49185.3	.74	0.0	11:15:29	58
110	50164.1	.29	0.0	11:15:38	78
120	52475.9	.51	0.0	11:15:48	58
130	52769.6	1.8	0.0	11:15:58	68
140	54141.5	2.3	0.0	11:16:09	58
150	53901.9	4.1	0.0	11:16:18	38
160	53272.1	5.0	0.0	11:16:29	38
170	53441.4	1.9	0.0	11:16:41	68
180	53821.8	19.	0.0	11:16:57	38
190	55063.7	4.2	0.0	11:17:08	58
200	58937.1	7.1	0.0	11:17:18	34
210	53198.6	17.	0.0	11:17:27	33
220	52139.9	1.0	0.0	11:17:37	58
230	50983.9	.40	0.0	11:17:47	68

Line: 22 Date: 12 JUL 90 #422

POSITION	FIELD	ERR	DRIFT	TIME	DS
210	59482.4	.30	0.0	11:18:32	64
200	59592.9	.18	0.0	11:19:13	88
190	59131.1	.13	0.0	11:19:25	88
180	58778.0	.07	0.0	11:19:35	88
170	58175.8	.07	0.0	11:19:47	88
160	57189.9	.16	0.0	11:19:57	86

150	56828.5	1.0	0.0	11:20:08	58
140	57358.2	.49	0.0	11:20:17	57
130	56095.8	.07	0.0	11:20:31	88
120	54698.6	.09	0.0	11:20:43	88
110	53683.3	.08	0.0	11:20:56	88
100	52353.9	2.3	0.0	11:21:07	58
90	51870.0	1.5	0.0	11:21:19	68
80	52387.7	.15	0.0	11:21:28	88
70	54081.0	.26	0.0	11:21:39	78
60	56384.0	2.7	0.0	11:21:50	68
50	57643.0	10.	0.0	11:22:02	48

Line: 23 Date: 12 JUL 90 #439

POSITION	FIELD	ERR	DRIFT	TIME	DS
70	57293.2	.42	0.0	11:22:19	58
80	56669.7	5.7	0.0	11:22:51	48
90	54732.2	.13	0.0	11:23:01	88
100	52515.9	.63	0.0	11:23:13	57
110	52062.2	3.3	0.0	11:23:22	68
120	52647.7	.79	0.0	11:23:33	58
130	53776.7	.13	0.0	11:23:41	88
140	55806.4	.08	0.0	11:23:52	88
150	57069.3	.11	0.0	11:24:05	88
160	58762.6	.93	0.0	11:24:19	48
170	58569.2	.05	0.0	11:24:30	88
180	59808.5	.20	0.0	11:24:42	78
190	60265.1	.06	0.0	11:24:53	88
200	61148.8	.07	0.0	11:25:02	88
210	62208.7	.84	0.0	11:25:12	58
220	61539.0	.21	0.0	11:25:23	78
230	61707.3	.21	0.0	11:25:36	88

Line: 24 Date: 12 JUL 90 #456

POSITION	FIELD	ERR	DRIFT	TIME	DS
210	64961.9	.76	0.0	11:26:07	58
200	64671.4	.24	0.0	11:26:32	88
190	64788.8	2.7	0.0	11:26:41	58
180	64000.1	1.5	0.0	11:26:49	48
170	62839.6	.19	0.0	11:26:59	88
160	62119.3	.35	0.0	11:27:09	58
150	60426.5	.09	0.0	11:27:19	88
140	58650.4	.13	0.0	11:27:29	88
130	57464.6	.11	0.0	11:27:38	87
120	55490.0	.17	0.0	11:27:46	77
110	53611.7	.45	0.0	11:27:56	58
100	52844.8	.18	0.0	11:28:05	78
90	52122.5	.40	0.0	11:28:15	58
80	52226.6	1.0	0.0	11:28:26	48
70	54165.9	.26	0.0	11:28:38	78
60	55853.7	.15	0.0	11:28:49	88
50	56411.4	.08	0.0	11:28:59	88

Line: 25 Date: 12 JUL 90 #473

POSITION	FIELD	ERR	DRIFT	TIME	DS
70	57366.7	.76	0.0	11:29:12	48
80	57327.0	2.1	0.0	11:29:33	37

90	55092.3	.16	0.0	11:29:41	78
100	52415.0	1.2	0.0	11:29:50	47
110	52005.1	.80	0.0	11:29:58	58
120	53612.4	.15	0.0	11:30:11	88
130	54455.4	1.1	0.0	11:30:19	88
140	57157.3	.23	0.0	11:30:29	87
150	58973.6	.33	0.0	11:30:37	68
160	60840.5	.22	0.0	11:30:47	68
170	62479.1	4.5	0.0	11:30:57	68
180	65218.6	18.	0.0	11:31:05	36
190	64951.3	1.4	0.0	11:31:13	48
200	65447.4	9.2	0.0	11:31:23	48
210	67394.6	9.5	0.0	11:31:33	43
220	67855.4	1.9	0.0	11:31:41	68
230	67615.1	.86	0.0	11:31:50	48
Ref. Fld	53039.1	.18	0.0	11:33:16	73

DATA AS COLLECTED IN THE FIELD
1991 SURVEY
PHILADELPHIA NAVAL SHIPYARD

LINE: 0 Direction: Date: 28- 8-91 Time: 18:57
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 0 Final station: 300

Station	Cond. [mS/m]	Inphase [ppt]
0.000	302.000	45.374
12.500	232.000	31.465
25.000	221.400	9.007
37.500	259.400	6.226
50.000	240.800	5.323
62.500	230.400	12.186
75.000	183.600	3.023
87.500	187.800	14.836
100.000	234.600	15.052
112.500	280.800	25.252
125.000	313.800	32.345
137.500	241.800	12.210
150.000	181.800	10.717
162.500	124.800	8.863
175.000	95.400	5.864
187.500	87.000	-12.703
200.000	91.800	2.673
212.500	78.600	2.721
225.000	84.000	1.842
237.500	77.400	-0.661
250.000	57.600	0.879
262.500	55.200	-1.203
275.000	36.000	1.216
287.500	24.600	-5.430
300.000	79.200	6.370

LINE: 12.5 Direction: Date: 28- 8-91 Time: 19: 0
Component: Both Dipole mode: Vertical Instrument Orientation: 1
Start station: 300 Final station: 0

Station	Cond. [mS/m]	Inphase [ppt]
300.000	72.600	5.660
287.500	40.800	-2.733
275.000	30.000	7.093
262.500	36.000	3.155
250.000	29.400	2.673
237.500	49.200	1.963
225.000	78.600	1.987
212.500	67.800	7.875
200.000	81.600	3.287
187.500	68.400	-1.468
175.000	96.000	4.215
162.500	98.400	5.828
150.000	129.000	10.597
137.500	143.400	14.799

125.000	178.800	20.146
112.500	194.400	18.207
100.000	187.800	14.077
87.500	149.400	7.719
75.000	130.200	6.587
62.500	114.600	8.766
50.000	109.800	5.190
37.500	126.600	8.116
25.000	126.600	7.827
12.500	115.200	7.045
0.000	97.200	-0.722

LINE: 25 Direction: Date: 28- 8-91 Time: 19: 2
 Component: Both Dipole mode: Vertical Instrument Orientation: 1
 Start station: 0 Final station: 300

Station	Cond. [mS/m]	Inphase [ppt]
0.000	36.000	-26.804
12.500	109.800	5.094
25.000	102.600	5.756
37.500	114.000	1.144
50.000	122.400	5.636
62.500	143.400	9.573
75.000	151.200	7.659
87.500	144.600	-1.324
100.000	154.800	12.512
112.500	157.800	11.235
125.000	172.200	17.304
137.500	130.800	11.572
150.000	102.000	12.596
162.500	93.000	8.068
175.000	93.000	-11.427
187.500	72.600	-3.756
200.000	82.800	4.672
212.500	73.200	2.143
225.000	65.400	-0.481
237.500	48.600	-1.336
250.000	37.200	-0.168
262.500	16.800	-1.685
275.000	16.800	0.590
287.500	19.200	0.939
300.000	78.000	3.865

LINE: 37.5 Direction: Date: 28- 8-91 Time: 19: 4
 Component: Both Dipole mode: Vertical Instrument Orientation: 1
 Start station: 300 Final station: 0

Station	Cond. [mS/m]	Inphase [ppt]
300.000	100.800	10.151
287.500	60.000	-0.878
275.000	30.600	1.626
262.500	22.200	-3.022
250.000	37.800	-0.782
237.500	37.800	-0.974
225.000	55.200	-1.083
212.500	78.600	-1.348
200.000	74.400	-8.368

187.500	90.000	3.564
175.000	99.000	-1.143
162.500	86.400	5.491
150.000	117.600	3.372
137.500	135.600	8.610
125.000	148.200	6.274
112.500	156.600	14.655
100.000	195.000	15.691
87.500	181.200	3.781
75.000	192.000	8.947
62.500	222.600	11.259
50.000	182.400	5.587
37.500	162.600	1.939
25.000	133.800	1.614
12.500	125.400	0.458
0.000	111.000	-0.083

LINE: 50 Direction: Date: 28- 8-91 Time: 19: 6
 Component: Both Dipole mode: Vertical Instrument Orientation: 1
 Start station: 0 Final station: 300

Station	Cond. [mS/m]	Inphase [ppt]
0.000	138.000	-1.829
12.500	154.200	-0.541
25.000	157.200	3.998
37.500	166.800	5.503
50.000	151.200	6.816
62.500	144.000	21.928
75.000	155.400	9.429
87.500	183.600	6.226
100.000	213.600	6.310
112.500	190.800	7.514
125.000	170.400	15.883
137.500	85.800	2.950
150.000	67.800	3.528
162.500	84.000	3.239
175.000	110.400	3.974
187.500	88.200	6.731
200.000	80.400	-3.214
212.500	81.600	0.602
225.000	62.400	-2.540
237.500	51.600	0.012
250.000	25.200	-2.829
262.500	15.600	-1.878
275.000	31.200	-1.902
287.500	36.000	-3.575
300.000	72.600	7.863

LINE: 62.5 Direction: Date: 28- 8-91 Time: 19: 9
 Component: Both Dipole mode: Vertical Instrument Orientation: 1
 Start station: 300 Final station: 0

Station	Cond. [mS/m]	Inphase [ppt]
300.000	146.400	16.329
287.500	56.400	1.614
275.000	33.600	-1.914
262.500	39.000	0.361

250.000	43.800	-0.047
237.500	31.200	2.324
225.000	51.000	3.613
212.500	89.400	4.203
200.000	89.400	6.924
187.500	87.600	6.442
175.000	102.000	9.320
162.500	87.600	9.320
150.000	115.800	12.825
137.500	139.200	20.158
125.000	162.000	13.860
112.500	174.000	12.644
100.000	163.200	10.886
87.500	162.600	11.753
75.000	122.400	8.766
62.500	129.600	12.861
50.000	162.000	4.985
37.500	160.800	6.984
25.000	160.200	8.261
12.500	132.600	4.612
0.000	100.800	5.250

LINE: 75 Direction: Date: 28- 8-91 Time: 19:11
 Component: Both Dipole mode: Vertical Instrument Orientation: 1
 Start station: 0 Final station: 300

Station	Cond. [mS/m]	Inphase [ppt]
0.000	92.400	-9.524
12.500	111.600	3.468
25.000	134.400	4.299
37.500	183.000	11.548
50.000	165.000	4.949
62.500	141.600	7.418
75.000	133.200	7.996
87.500	135.000	19.351
100.000	111.600	-0.818
112.500	138.600	15.101
125.000	147.000	4.480
137.500	139.200	10.657
150.000	115.800	10.958
162.500	85.800	5.587
175.000	89.400	8.357
187.500	93.600	3.360
200.000	127.800	-0.782
212.500	79.800	4.263
225.000	72.600	1.240
237.500	59.400	1.999
250.000	37.800	4.010
262.500	22.800	0.819
275.000	37.800	1.638
287.500	50.400	1.072
300.000	137.400	26.902

LINE: 87.5 Direction: Date: 28- 8-91 Time: 19:14
 Component: Both Dipole mode: Vertical Instrument Orientation: 1
 Start station: 287 Final station:-.5

Station	Cond. [mS/m]	Inphase [ppt]
287.000	113.400	15.823
274.500	33.000	2.637
262.000	23.400	0.686
249.500	8.400	-13.462
237.000	52.200	0.999
224.500	72.000	6.226
212.000	100.800	3.348
199.500	110.400	3.516
187.000	112.800	3.829
174.500	93.000	8.104
162.000	72.600	2.890
149.500	54.600	7.791
137.000	105.600	7.430
124.500	82.800	18.135
112.000	85.200	9.694
99.500	129.600	-0.192
87.000	103.800	14.462
74.500	129.600	10.115
62.000	116.400	7.430
49.500	120.600	8.538
37.000	153.600	8.935
24.500	156.000	4.564
12.000	106.200	-3.876
-0.500	90.600	1.012

LINE: 100 Direction: Date: 28- 8-91 Time: 19:21
 Component: Both Dipole mode: Vertical Instrument Orientation: 1
 Start station: 0 Final station: 275

Station	Cond. [mS/m]	Inphase [ppt]
0.000	104.400	4.757
12.500	94.800	1.686
25.000	115.800	-1.589
37.500	159.600	11.211
50.000	134.400	11.476
62.500	115.200	5.961
75.000	127.200	6.972
87.500	115.200	6.864
100.000	107.400	18.846
112.500	109.200	19.171
125.000	114.600	11.970
137.500	105.000	4.648
150.000	87.000	6.743
162.500	83.400	3.974
175.000	114.600	4.913
187.500	97.800	4.757
200.000	99.000	2.890
212.500	106.800	5.323
225.000	87.600	1.842
237.500	51.000	0.024
250.000	37.200	2.180
262.500	27.600	-4.996
275.000	66.000	13.559

LINE: 112.5 Direction: Date: 28- 8-91 Time: 19:24

Component: Both Dipole mode: Vertical Instrument Orientation: 1
 Start station: 250 Final station: 0

Station	Cond. [mS/m]	Inphase [ppt]
250.000	32.400	4.877
237.500	54.000	4.094
225.000	58.200	3.673
212.500	102.600	3.504
200.000	107.400	8.803
187.500	103.800	7.875
175.000	100.800	12.584
162.500	102.600	5.310
150.000	98.400	-0.902
137.500	99.600	8.369
125.000	113.400	16.774
112.500	113.400	23.434
100.000	136.800	15.185
87.500	98.400	7.105
75.000	124.800	14.812
62.500	128.400	12.042
50.000	115.200	6.322
37.500	100.800	13.884
25.000	141.600	13.427
12.500	135.600	7.586
0.000	109.800	0.301

LINE: 125 Direction: Date: 28- 8-91 Time: 19:26

Component: Both Dipole mode: Vertical Instrument Orientation: 1
 Start station: 0 Final station: 250

Station	Cond. [mS/m]	Inphase [ppt]
0.000	100.800	7.309
12.500	127.800	12.307
25.000	137.400	5.202
37.500	100.200	6.021
50.000	59.400	11.777
62.500	132.600	11.127
75.000	124.200	14.330
87.500	135.600	17.810
100.000	166.200	19.279
112.500	107.400	15.956
125.000	120.000	9.814
137.500	124.200	6.129
150.000	120.000	4.805
162.500	114.600	6.888
175.000	87.000	-2.419
187.500	96.600	0.229
200.000	114.600	9.140
212.500	105.000	0.927
225.000	70.200	0.554
237.500	51.600	-1.926
250.000	81.000	2.300

LINE: 137.5 Direction: Date: 28- 8-91 Time: 19:28

Component: Both Dipole mode: Vertical Instrument Orientation: 1
 Start station: 225 Final station: 0

Station	Cond. [mS/m]	Inphase [ppt]
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225.000	72.000	14.631
212.500	83.400	11.500
200.000	96.600	0.795
187.500	110.400	7.093
175.000	119.400	14.547
162.500	129.000	11.753
150.000	167.400	12.439
137.500	144.000	16.810
125.000	139.800	7.743
112.500	133.200	16.823
100.000	138.000	16.317
87.500	147.600	22.277
75.000	131.400	17.846
62.500	115.800	17.617
50.000	100.800	10.151
37.500	77.400	8.742
25.000	94.800	12.933
12.500	117.000	3.119
0.000	91.200	5.262

LINE: 150 Direction: Date: 28- 8-91 Time: 19:30

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start station: 0 Final station: 200

Station	Cond. [mS/m]	Inphase [ppt]
0.000	86.400	9.995
12.500	105.000	8.911
25.000	75.000	4.648
37.500	72.000	9.068
50.000	78.600	12.427
62.500	118.800	21.495
75.000	129.600	18.027
87.500	145.800	32.441
100.000	174.000	16.293
112.500	162.000	18.677
125.000	158.400	18.304
137.500	153.000	-1.083
150.000	89.400	-3.551
162.500	88.800	-1.829
175.000	116.400	18.243
187.500	120.600	9.357
200.000	111.600	7.767

LINE: 162.5 Direction: Date: 28- 8-91 Time: 19:31

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start station: 175 Final station: 0

Station	Cond. [mS/m]	Inphase [ppt]
175.000	126.600	13.342
162.500	108.600	17.340
150.000	111.000	8.465
137.500	142.200	14.559
125.000	153.000	13.330
112.500	156.000	15.450
100.000	169.200	34.283
87.500	160.800	35.849
75.000	148.800	30.743

62.500	126.600	18.918
50.000	93.600	4.347
37.500	82.800	8.947
25.000	72.600	4.961
12.500	76.200	7.454
0.000	72.600	7.502

LINE: 175 Direction: Date: 28- 8-91 Time: 19:33

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start station: 0 Final station: 162.5

Station	Cond. [mS/m]	Inphase [ppt]
0.000	60.600	-0.059
12.500	63.000	7.225
25.000	75.000	9.393
37.500	79.800	4.660
50.000	80.400	16.943
62.500	129.600	24.746
75.000	141.000	26.926
87.500	145.200	33.717
100.000	152.400	23.409
112.500	143.400	13.656
125.000	118.200	1.469
137.500	118.800	15.666
150.000	129.000	16.582
162.500	109.200	22.241

LINE: 187.5 Direction: Date: 28- 8-91 Time: 19:34

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start station: 150 Final station: 0

Station	Cond. [mS/m]	Inphase [ppt]
150.000	82.800	14.029
137.500	84.600	10.705
125.000	84.600	4.431
112.500	114.600	10.199
100.000	131.400	15.594
87.500	127.800	28.708
75.000	111.600	29.695
62.500	119.400	23.421
50.000	80.400	6.683
37.500	93.600	10.633
25.000	81.000	4.624
12.500	52.800	4.419
0.000	43.200	1.072

LINE: 200 Direction: Date: 28- 8-91 Time: 19:36

Component: Both Dipole mode: Vertical Instrument Orientation: 1

Start station: 0 Final station: 137.5

Station	Cond. [mS/m]	Inphase [ppt]
0.000	33.000	-2.347
12.500	36.000	-0.830
25.000	64.200	-3.696
37.500	79.800	11.187
50.000	89.400	18.665
62.500	74.400	25.240
75.000	90.600	25.914
87.500	67.800	12.764

100.000	90.000	9.910
112.500	91.800	8.779
125.000	70.200	9.935
137.500	99.000	17.979